

PLANT LIFE



1952

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See page 143, for the AMERICAN AMARYLLIS SOCIETY, an integral branch of the AMERICAN PLANT LIFE SOCIETY, which functions as a comprehensive committee for the advancement of the amaryllids.

See page 170, for other plant group committees.

See pages 170-171, for publications of the SOCIETY.

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1952

EDITED BY

HAMILTON P. TRAUB

HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

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CORRIGENDA

PLANT LIFE, VOL. 7, 1951

Page 3, II. SPECIOLOGY section, after last line, insert "Amaryllid Genera and Species, by Harold N. Moldenke _____ 78."

Page 17, 4th paragraph, 4th line, for "door-yearad" read "door-yard".

Page 38, line 19 from top, between "is" and "fine" insert "a".

Pages 68—71, wherever "*Amaryllis advena* Ker-Gawl." appears change to "*Amaryllis bifida* Herb."

Page 76, under "Hybrid Amaryllis Clone", 3rd line, for "coloe" read "color".

Page 156, 6th paragraph, 6th line, for "vanadly" read "vanadyl".

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HERBERTIA

1952

SECOND ALSTROEMERIA EDITION

EDITED BY

HAMILTON P. TRAUB

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THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

[HERBERT MEDAL CITATION, continued from page 8.]

By ignoring the unmistakable facts in SPECIES PLANTARUM, ed. 1. 1753; by disregarding the prior 1783-work of the great French scientist, Lamarck; and by acting directly contrary to the later adopted retro-active INTERNATIONAL RULES, a few workers had attempted, fortunately without success, to switch names. It was Dr. Uphof who, reinforced by the 1929 contribution of the late Kew authority, Dr. Stapf [Bot. Mag. Lond. 153: sub pl. 9152, footnote page 3. 1929], and the 1943 HERBERTIA contribution [HERBERTIA 9(1942): 101—102, 146. 1943] of Mr. Hannibal, presented facts that showed the untenable nature of any such attempts.

It will not be necessary to go into the minute details here since these are now generally known. These facts have recently been fully reviewed by Traub & Moldenke [AMARYLLIDACEAE: TRIBE AMARYLLEAE. 1949]. In accordance with the INTERNATIONAL RULES OF BOTANICAL NOMENCLATURE, the facts, in brief, are: (1) Linnaeus unmistakably omitted the CAPE BELLADONNA form SPECIES PLANTARUM, ed. 1. 1753, and it was not mentioned in this work even incidentally. This in itself should have been sufficient to stop any attempted misapplication of names. (2) The name, *Amaryllis beladonna* L., was given by Linnaeus in SPECIES PLANTARUM ed. 1. 1753 to the AMERICAN BELLADONNA as indicated by no less than 15 direct and indirect literature references, including three unmistakable illustrations, and a direct statement by the eminent Dutch scientist, Hermann, in 1698, that it was a plant with a hollow peduncle. (3) The great French scientist, Lamarck, noted the omission of the CAPE BELLADONNA [a plant known to have a solid peduncle], and gave to it the first name under the INTERNATIONAL RULES, *Amaryllis rosea* Lamarck (1783). (4) William Herbert in 1819 made the AMERICAN BELLADONNA the type of the generic name, *Amaryllis* L.; and (5) in the same year, 1819, Herbert also proposed the valid generic name, *Coburgia Herb.*, with the CAPE BELLADONNA as the type. (6) The actions under (4) and (5) above are irreversible under the INTERNATIONAL RULES OF THE BOTANICAL NOMENCLATURE. (7) The attempt of Herbert, in 1821, to reverse himself for sentimental reasons, and the later attempts of a few to bring in immaterial *ex post facto* happenings, and to try to use immaterial alleged circumstantial evidence in botanical science, all have no effect under the INTERNATIONAL RULES which are set up to settle cases according to facts. (8) For the CAPE BELLADONNA, the valid name is *Coburgia rosea* (Lamarck) Gouws [PLANT LIFE 5: 64. 1949], if it is to be maintained as the type of a nomenclatural genus. However, it produces fertile hybrids with *Brunsvigia* species, and the morphological differences between the two genera are only of specific importance, and thus the CAPE BELLADONNA has been transferred to the latter, and it becomes *Brunsvigia rosea* (Lamarck) Hannibal, if the viewpoint is accepted that there must be a distinct gap for generic distinctions.

[HERBERT MEDAL CITATION, continued on page 35.]

PREFACE

This is the 19th consecutive volume of HERBERTIA, the publication devoted exclusively to the amaryllids and the workers concerned with their advancement. As the present members know, the articles are written *by the members* of the AMERICAN AMARYLLIS SOCIETY which is an integral part of the AMERICAN PLANT LIFE SOCIETY, and functions as a comprehensive committee for the advancement of the amaryllids. *For the information of new members*, it should be indicated that it is the objective to include as many suitable amaryllid articles of a *popular nature as can be obtained* and accommodated, and also articles on fundamental amaryllid research. The members of course realize that without new discoveries, the spring of amaryllid knowledge would soon dry up, and we would soon be marking time—repeating ideas already known, and thus progress would come to a stop. This was actually the case for about fifty years before the present Society was organized in 1933. The volumes of HERBERTIA are thus a mine of amaryllid knowledge, including descriptions of new species and cultivated varieties, breeding methods, propagation procedures and amaryllid culture. In addition to HERBERTIA, the Society also published occasional numbers on other plant subjects of interest to the members so as to maintain a *well rounded gardening viewpoint*. Due to the post war inflated prices, the various numbers are bound in one book as a temporary economy measure so as to delay any increase in dues as long as possible.

The 1952 WILLIAM HERBERT MEDAL has been awarded to Dr. J. C. Th. Uphof, the eminent Dutch-American plant scientist, to whom we all owe a debt of gratitude. His *research* articles in 1938 and 1940 HERBERTIA on the name *Amaryllis* L., have made it possible for all of us to use this name correctly. No longer need we use *Amaryllis* in popular, and an inelegant invalid name in scientific usage. The right name has been stabilized for all time.

This edition is dedicated to Dr. Uphof, and in accordance with tradition, he contributes an interesting autobiography to it, detailing his activities in Europe and America.

The 1ST ALSTROEMERIA EDITION appeared a decade ago, in 1942, and it is fitting that the progress in *Alstroemeria* breeding and culture since that date is now summarized in the present 19th consecutive issue of HERBERTIA, devoted exclusively to the amaryllids, which thus becomes the 2ND ALSTROEMERIA EDITION.

The beautiful cover design by Mr. Mulford B. Foster is based on *Alstroemeria racinae*, a fragrant hybrid originated by the artist.

Dr. Uphof contributes a review of the genus *Alstroemeria*, long overdue, for which the members will surely be very grateful. It is hoped that Dr. Killip of the U. S. NATIONAL HERBARIUM, the only world authority on the genus *Bomarea*, will contribute a much needed monograph on that genus in the columns of the CONTRIBUTIONS OF THE U. S. NATIONAL HERBARIUM.

Other contributions on *Alstroemeria* in the present issue include an article on fragrant *Alstroemeria* hybrids by Mr. Foster, an article on

advances in *Alstroemeria* culture by Mr. Harry L. Stinson, and other interesting *Alstroemeria* articles by Prof. Bullock, Prof. Ballard, Mr. Ruckman and Mr. Orpet.

However, the other amaryllids are not neglected in the present issue. Mr. Manley contributes a report on the 1951 *Amaryllis* display at Cleveland, and a summary of the 1951 Valleevue *Amaryllis* trials; Mrs. Morton reports on the 1951 New Orleans Amaryllis Show. Interesting *Amaryllis* articles are also contributed by E. Dourlas, Hermon Brown, Dr. Thornburgh, and Dr. Buck.

Wyndham Hayward reports on the 1951 Orlando-Winter Park *Hemerocallis* Show, and Dr. Corliss shares with us his 1951 visits to *Hemerocallis* gardens. Mrs. Henry presents further details on an *Hemerocallis* chimera, Prof. Ballard writes on progress in *Hemerocallis* breeding, and Mr. Gilmer reports on the selection of *Hemerocallis* clones for garden value.

There is also a wealth of other amaryllid articles in the present issue, including, among others, contributions on the 1951 Daffodil Season by Mr. Mitch, Australian amaryllids by Prof. Eardley, *Lapiedra martinezii* by Dr. A. Fernandes, Alliums by Bernard Harkness and Dr. Uphof, *Zephyranthes* by Mrs. Clint, *xCrinodonna* by Mr. Hannibal, garden value of amaryllids by Mr. Hunt, Texas amaryllids by Thad Howard, *Crinum*s by Mr. Hayward, *Hymenocallis* by Mr. Woelfle and Mr. Hayward, and winter-forced amaryllids by Mrs. Henry.

The 1953 HERBERTIA will be the 2ND NARCISSUS EDITION. However, the other amaryllids as usual, will not be neglected in this issue. The members are urged to send in articles for this issue as soon as convenient, before July 1, 1952, if at all possible.

Your senior editor has reached retirement age, and by the end of the present year, he will make his home at 1531 Rodeo Road, Arcadia, California. Members journeying in the neighborhood are invited to stop in to visit. He will have additional leisure time to devote to his editorial duties. One of the first projects to be undertaken is the writing of a *popular* HANDBOOK OF AMARYLLIS which is most urgently needed.

—Hamilton P. Traub
Harold N. Moldenke

December 17, 1951.

1952 HERBERT MEDAL AWARD CITATION

The following citation for the 1952 WILLIAM HERBERT MEDAL award is reproduced for the information of the members.

"The scientific world owes the eminent Dutch-American botanist, Dr. Uphof, a debt of gratitude. It was he who published his stimulating HERBERTIA articles in 1938 and 1940 on the correct application of the names, *Amaryllis* L. (genus), and *Amaryllis belladonna* L. (species).

[HERBERT MEDAL CITATION, continued on page 6.]

DEDICATED TO
J. C. TH. UPHOF



Herbert Medalist—Dr. J. C. Th. Uphof

Plate 1

JOHANNES CORNELIS THEODORUS UPHOF

An autobiography

It is a great honor to receive the HERBERT MEDAL award for having added some light on the nomenclature of *Amaryllis* L., the type genus of the *Amaryllidaceae*. My article was written on invitation some years ago of Dr. Hamilton P. Traub, and Mr. Wyndham Hayward, asking me to contribute something for the Yearbook HERBERTIA. I chose to conduct a research into the history of the names *Amaryllis* and *Hippeastrum*. As a result of all of this, I have now to appear in this issue of HERBERTIA with an autobiography. *Jacta alea est*.

My relations to the plant sciences have always been varied and extensive. There is no doubt that this was due to the stimulus I received at an early age.

CHILDHOOD AND YOUTH

I was born on June 11, 1886 in Ouder Amstel near Amsterdam, Netherlands. [Fig. 1] I was an only child. [Figs. 2 and 3] My father Th. J. Uphof and my grandfather J. G. Uphof were both well known lumber merchants. They obtained their lumber from abroad, especially by ocean steamer from Sundsvall in Sweden, Archangel in Russia and by rafts via the Rhine from the Schwarzwald or Black Forests in Germany, since Holland can not be considered a lumber producing country. The grandfather on my mother's side, J. H. Vermolen was an engineer, having charge of the repairs of the big ocean steamers sailing between Amsterdam and Java.

There are many happenings in my early life, before I was four years old, that I can vividly remember. The hobby of my father was always the study of English and French literature. My mother and my grandparents influenced me in the direction of nature study, especially plants. Also the environment of our lovely country home along the river De Amstel [Fig. 1] in which I was born and reared, and which was one of the wedding gifts of my mother's parents, added to my opportunity for nature study. With my father or when alone, I went on trips, collecting native plants and I soon started an herbarium. At an early age I tried to learn the scientific names, because it was always impressed upon me that common names were of little or no use and caused confusion. I also went with my father on walks to different parts of the port of Amsterdam, where I could see the big ocean steamers from far off countries. I wondered at that time whether I would ever have a chance to visit these countries when I became older.

Who could fathom my delight when I got in 1897, as a present during St. Nicholaas (December 6) from my grandmother Uphof, my first book on nature study. It was entitled "Door het Rietland" (Through

the Reedland) by E. Heimans and Jac. P. Thijsse, which was followed later during other St. Nicholaas Feasts and birthdays by additional volumes of this series, so popular in the Netherlands. At an early age my parents gave me a Dutch translation of Kerner von Marilaun's "Pflanzenleben" and Brehm's "Tierleben." These extensive and well known works stimulated my love for nature tremendously.

At the proper ages I attended the Elementary School and the High School. It must be said that the studies in Holland, like in most countries of Europe, are very difficult indeed. Besides the complicated grammar of the Dutch language, it was a "must" and nothing else, to study "de drie vreemde talen" (the three foreign languages), under which are understood English, French and German. I had to start in my time with French when I was nine years old, and at the age of eleven, we children were obliged to speak French in school during most of the courses and also during play time. For each Dutch word that we spoke, we were fined one cent. Also at home I often had to speak French with my father. To this foreign language were later gradually added German and finally English, of which I had only three years. With these came ordinary courses, like history, mathematics, geography, sciences and other regular subjects. I regret very much that we never learned public speaking. Even at the present time it is not greatly emphasized. This is very essential for those coming to the United States.

Vacation time, which lasted from 4 to 6 weeks, was always welcome. This time was usually passed with my parents and grandparents in the vicinity of Arnhem (eastern Holland) or near Haarlem; also along the river De Vecht with its beautiful castles and pretty estates, surrounded by grand parks and gardens. We visited the rich collections in the hot houses filled with exotic orchids and other tropical plants. The experienced "tuinbaas" (estate gardener) told us many interesting things about all these unusual plants. Needless to say, we also visited the bulb fields during "de bollentijd" (the bulb time), roaming over the nurseries of van Waveren and van der Schoot that were covered with masses of flowering hyacinths and tulips. We saw the beautiful flowering *Amaryllis* hybrids in the greenhouses of Ludwig. I often entered the grounds of "De Hartecamp" where once Carolus Linnaeus worked under the wealthy George Clifford. Some of the big greenhouses, so-called "orangeries" were still there. No doubt the great Swedish botanist must have worked in these houses. When in Arnhem, we regularly visited some parts of western Germany.

When I finished my Secondary School education, I decided to specialize first in horticulture and later in botany. I was advised to work first for a year in a nursery before entering college. Therefore, I became a student helper in the nursery of Mr. van der Hoeve, Rustenburger Straat in Amsterdam which was a very large establishment, having many greenhouses where very much was to be learned. It was here that I saw for the first time a group of *Brunsvigia rosea* (Lamarek) Hannibal (syn.—*Amaryllis belladonna* Herb., non Linn.). The next year I was

admitted to the well known College of Horticulture at Frederiksoord, a foremost institution where many pleasant years were spent. The collection of plants in the many greenhouses, arboretum, rockeries, orchards and those in the division for annuals and perennials were tip-top and could favorably be compared with similar institutions I visited later in Germany, France, Belgium and England. At the present time this institution has expanded still more.



Fig. 1. The Uphof Home on the de Amstel River, Ouder Amstel, near Amsterdam, where Dr. Uphof was born and reared.

After graduation, I took up post graduate studies at the University of Amsterdam where I attended a number of courses in botany under the world famous botanist Prof. Hugo de Vries, the founder of experimental evolution and one of the rediscoverers of the Laws of Mendel. Besides this, he was also an outstanding plant physiologist. I need hardly mention how much influence this association had on my life. My work in the Botanical Garden and Botanical Institution was unusually happy and I took advantage of everything relating to botany. I frequently helped De Vries in his experimental work. Later I kept up correspondence with him until shortly before his death in 1935. I regularly visited him upon my return to Holland. I also got acquainted with

Mr. A. J. van Laren, the Hortulanus (Curator) of the Botanical Garden or Hortus Botanicus. He is well known for a book he wrote on cacti, containing many colored illustrations and which has been translated into English.

In the meantime I became member of de Nederlandsch Natuurhistorische Vereeniging (The Netherlands Society for Natural History), division Amsterdam. This society had many members among the students, teachers and cultured laymen. Lectures and demonstrations were given in one of the halls of Natura Artis Magistra, the Amsterdam Zoo. There were also enjoyable excursions with the members to different parts of the country where the flora and fauna of the Netherlands were studied under an expert guide. Occasionally I had something to demonstrate during the meetings and became better acquainted with the chairman, Dr. H. Heukels, instructor of botany and zoology of one of the high schools in Amsterdam, who was author of the three volumes of "De Flora van Nederland." He had great influence on my biological career. He was also editor-in-chief of "Woordenboek voor Nederlandsche Plantennamen" (Dictionary of Dutch Plant Names) of which I was collaborator, collecting vernacular plant names for the most part from the province of Drente.

Occasionally, I also attended the meetings of the Nederlandsche Maatschappij voor Tuinbouw en Plantkunde (the Netherlands Society for Horticulture and Botany). I attended the lectures of Dr. J. Ritzema Bos, Professor of Plant Pathology, also well known in this country. I might add that I was lucky to receive a silver medal for a number of herbarium plants that were exhibited in an horticultural fair in the city of Sneek (Friesland).

I was therefore brought up in an entirely Dutch atmosphere and culture with every possible advantage offered by my parents and grandparents. I was no less stubborn than any other Hollander, a character of which many are proud. It is found in the entire Nation. It could not be conquered by the Germans under Hitler; by the French under Napoleon, or by the Spaniards under Charles V and Phillip II, who were no more successful during the Eighty Years War. Who else could? Independence comes foremost.

EUROPEAN TRAVELS

The time arrived when I wished to continue my studies and experiences in foreign countries, against which my parents had no objection. In fact it is a part of the life of an educated Hollander to go abroad for some years. Otherwise it was said that he might become narrow-minded. Therefore studies and work abroad are much encouraged. The first year I went to Germany and settled in Quedlinburg am Harz, one of the oldest towns in the country. Here were large seed nurseries where there was much opportunity to learn practical plant breeding and seed growing in the large establishments of Friedrich Roemer, Heinrich Mette and Gebruder Dippe. There was much opportunity to study the wild

flora in different parts of the Harz Mountains that were nearby. Afterward a few months were spent at the beautiful and modern Botanical Garden and Institution of the University of Berlin at Berlin-Dahlem, working in the herbarium, museum, and the extensive garden. In the plant geographical section practically the entire temperate zone was represented, and it is still unique. The numerous greenhouses offered much material in tropical and subtropical plants, among which the economic plants were very extensive. It was an honor to become acquainted with some of the outstanding German botanists, among whom were Adolf Engler, Ludwig Diels, H. Harms, R. Pilger and other eminent members of the staff. Upon my return to Quedlinburg, I visited the interesting potash mines in Stassfurt not far from Magdeburg. In the autumn I had to return to Holland. Most of the trip was on bicycle.



Fig. 2. Dr. Uphof at the age of 6 months.

I went through the Harz Mountains and then through a number of cities among which were Kassel, Mainz, Frankfurt am Main and Wiesbaden, finally along the Rhine to Bonn and Cologne, visiting along the way the lovely Frankfurter Palmengarten and some of the orchid nurseries. In Wiesbaden the parks and some of the large estates were visited. I was just in time to find the meadows of the Taunus Mountains covered with numerous wild flowering *Colchicum autumnale*. Every part of the College of Horticulture and Viticulture at Geisenheim am Rhein had to be inspected. It was very modern and attractive, as were also the numerous vineyards along the mountains. How beautiful were the large collections of Bromeliads in the Botanical Garden of the University of Bonn. Three greenhouses were filled with hundreds of species and hybrids. At present it is still among the larger Bromeliad collections in the world. My time was well spent in Germany and the Germans were always most helpful to foreigners to show everything of interest in their

country. At last I arrived in Maastricht, a city in the southern part of Holland; from there I took the train back to Amsterdam.

During the winter months in Amsterdam I attended some more lectures under de Vries and also had to learn Swedish from the Consul of Sweden, as it was my intention to go the following year to the Scandinavian Countries.

In February 1919 the S.S. Sunpulp, a Norwegian steamer brought me from Amsterdam to Gotenburg, Sweden. It was very cold at that time and the roads were difficult to pass on account of the snow and ice. Soon I found a convenient home in the small town of Moelndal, hoping that nobody would speak French, German or English in order to force myself to speak Swedish. From here I could make many trips to Gotenburg and other places of interest. Here was much to be learned. There was in the city the beautiful and extensive Traedgardfoereningen (Horticultural Society) with its large collections of plants, especially those displayed in the hothouses. The most outstanding at that time were the Orchids, Aroids and Palms. There was one large and high greenhouse filled with several varieties of *Camellia japonica*. I have never seen taller specimens, even in Florida. There was the interesting flora of Sweden along the rivers, including the Gota Elf, and the many lakes and the forests back in the country. The Swedish people were everywhere kind and hospitable. Everything typically Swedish had to be shown. Several hours by train in the southern direction of Gotenburg is Malmoe, and not far from this city is the small town of Svaloef with its world famous institution for plant breeding, called Sveriges Uetsaedesfoereningen where I had the privilege to stay quite a while. Everything was demonstrated to me regarding the scientific improvement of wheat, oats, barley, potatoes, beets and many other agricultural crops. They increased the harvest in Sweden considerably. The Svaloef varieties have also been introduced into many other countries. I had the pleasure of becoming acquainted with Dr. Hjalmar Nelson the director, with Dr. N. H. Nilson Ehle and many others of the staff.

Malmoe is not far from Copenhagen, Denmark. The narrow sound is soon crossed by boat. I visited in that country the Botanisk Have (Botanical Garden) and a number of nurseries and estates. Without exception they were well kept. The Danish know how to grow their plants.

After some time I returned to Sweden. On a Sunday when I bicycled to Saroe not far from the coast, where I planned to visit a number of estates, I had the privilege of watching the esteemed King Gustav V playing his beloved sport, namely lawn-tennis with one of the princesses. I have never seen a man playing so enthusiastically and with such attention as this ruler. Finally he left, crossed the road and went to his summer residence.

I returned to Holland in November. Upon my return I was able to spend some time in Norway, particularly Oslo, Drammen and Skien.

Upon my return to Holland I met Hugo de Vries who was delighted to hear that I had been in Svaloef for some time and was anxious to

hear about its new undertakings. De Vries visited this institution some years previously and had written much about it in different publications.

The next year I spent in Switzerland where I settled in Montreux on Lake of Geneva; the French speaking part of the country. This exceedingly beautiful region was ideally situated for reaching other parts of the land in order to study the different conditions of the alpine flora, high up in the mountains, using Prof. C. Schroeters' excellent book "Das Pflanzenleben der Alpen" constantly as a guide. A great deal of time was spent along the vineyards, the wineries; several estates with their attractive plant collections were visited among which were the property of Rothschild not far from Geneva, and the Botanical Garden near the



Fig. 3. Dr. Uphof at the age of 7 years.

same city. I became acquainted with Dr. Ernst Wilczek who was Professor of Botany at the University of Lausanne which had a very good Alpine Garden in the mountains near Pont de Nant. Some readers will be interested to hear about my friendship with Henry Correvon, a vigorous author and ambitious grower of alpine plants, who had his place near Geneva.

During that time my parents paid me a visit and took me for some weeks to the northern part of Italy. We greatly enjoyed the Italian lakes, among which were Lago di Como and Lago Maggiore with their exquisite backgrounds and beautiful old gardens. We also went for some time to Milano.

Later, after my return to Amsterdam, I went to see the northern half of France and was much of the time in Paris at le Jardin des Plantes of the Muséum d'Histoire Naturelle. I visited the beautiful parks around the Palace of Versailles that were laid out by the famous architect Le Notre under Louis XIV. In this region is also the École d'Horticulture. There was much to be seen and learned at Vilmorin & Andrieux, the world famous seed-growers. Later I visited several parts of Belgium.

The last of my "Wanderjahren," namely 1911, was spent in lovely England. As the reader is well aware, it was my intention to study at the Royal Botanical Garden at Kew, a place that I so often visited in later years. This enormous institution is the Mecca for every botanist, horticulturist and plant lover. Its thousands of plant species in the garden, arboretum and greenhouses; the extensive material in the museums and herbariums; the rich library, have much to offer to the student of systematic and economic botany. There is always courteous help from everyone. I remember the kind assistance and advice I always got from Sir David Prain, and later from Sir Arthur Hill, both Directors of the Institution. In the herbarium I had the help of Dr. Otto Stapf, Dr. T. A. Sprague and other members. I got the help of Dr. L. A. Boodle when doing some research work in the Jodrell Laboratory on Kew Green.

At the Department of Botany of the British Museum for Natural History in London, I became acquainted with Dr. A. R. Rendle, the Curator, and Dr. Yapp, one of the botanists. Every time I visited England, I could not forget the great British geneticist, Prof. William Bateson, Director of the John Innes Horticulturist Institute at Merton not far from Wimbledon. Prof. Bateson and his associates were always eager to show us the newest work in genetics. At the end of the discussions and demonstrations the greatest hospitality was shown. There was an English tea ready and the delicacies that go with it.

There are from England so many other pleasant reminiscences that I would like to relate, but I can not mention everything. I do wish to mention that in Teddington, Middlesex, I got acquainted with Miss Norah M. O'Connor whom I married in February 1912, and must add that we got in 1917 a most charming daughter, christened Bernice, who graduated later from the Washington School of Secretaries, and who became in 1942 Mrs. Harold W. Oliver, Jr., now living in Verona, New Jersey.

I CHOOSE AMERICA

I now decided to look for a final position, either in the Netherlands East Indies, Latin America, or in the United States. I finally decided on the last named country. Through the help of Dr. Charles E. Bessey, Professor of Botany at the University of Nebraska, I secured a position with his son Dr. Ernst A. Bessey, as Curator of the Botanical Garden and Herbarium and was later Instructor of Botany at the Michigan Agricultural College, later Michigan State College.

We sailed on the S.S. Olympic of the White Star Line and toward the end of February 1912 we were met at the railroad station in Lansing, Mich., by Dr. Richard de Zeeuw who was of Dutch descent and who spoke Dutch fluently. Soon I got acquainted with my attractive work in taking charge of the Botanical Garden; in rearranging the over 150,000 herbarium specimens from the old system of Bentham and Hooker to that of Engler and Prantl, to which was added later my course in dendrology. I had my own house built which was presented by my grandmother on my mother's side. It was always stimulating to work with Dr. Ernst Bessey, Head of Department of Botany and to get the views and opinions of his associates Dr. Richard de Zeeuw, Dr. R. P. Hibbard, plant physiologist, Dr. G. H. Coons, plant pathologist, and Dr. Ruth Allen, a very eminent cytologist.

I always noticed that American students are pleasant to get along with. I liked to teach them and I have to admit that I learned much from them.

In 1913 I became Assistant Professor of Botany and Plant Breeding at the State University of Arizona, and Assistant Botanist and Plant Breeder at the Arizona Agricultural Experiment Station in Tucson, Ariz. Much of the work was done in cooperation with Prof. J. J. Thornber, an expert on the flora of Arizona. He was a very broad-minded man. I took part in the breeding of alfalfa, papago sweet corn, tepary beans, wheat, date palms and sorghum. I also investigated the cold resistance of the spineless cacti. The environment of Tucson with the Carnegie Desert Laboratory was ideal for the study of the interesting xerophytic flora. I also had a chance to visit the northern part of Mexico.

During this time I received the honorary degree of Doctor of Science from Highland College for my scientific work.

One day we were pleasantly surprised by a visit from Frank N. Meyer, famous explorer of the U. S. Department of Agriculture. He introduced an enormous number of useful agricultural and horticultural plants from China through the U. S. Department of Agriculture. He was an Amsterdammer who had studied and worked under Hugo de Vries. He spoke the Dutch language still with ease and we were soon talking about old times in Holland. He was scared that he might have to face the public and give a talk which he dreaded. I assured him that I had not the slightest use for it either and he was relieved. At the introduction garden of the Station he was excited to see so many plants that were sent by him from China. He told me that later in life he would buy his own home where he could live quietly. It is very sad that a few years later he was drowned in the Yuang 'tze Kiang in China.

Toward the end of World War I, we returned to the Netherlands because my parents wanted us to come back for some time. I soon got a position to take charge of the plant breeding work of the Nederlandsche Elitezaad Maatschappij (Netherlands Elite Seed Company) where most of the time I was engaged in the breeding of sugar beets, wheat, rye, peas and dahlias for the inulin content in the tubers. Much

of the work was done with Dr. Klaas Tjebbes who later on went to Sweden.

In 1922 we returned to the U. S., and settled in Florida where we bought a home. I became Professor of Botany and Head of the Department of Biology at Rollins College in Winter Park. This is a society town with all that goes with it. I stayed there twenty years and it was pleasant to work the first three years under president Dr. R. J. Sprague and later under Dr. W. C. Weir, all able administrators. Later the conditions changed and had to be investigated. It is mighty interesting to read the "Rollins Report" in the Bulletin of the Am. Assoc. of Univ. Professors, 19 (nr. 7) : 416-438, 1933. There is also much that is curious to be read about this institution in Prof. J. Rice's book "I Came Out of the Eighteenth Century."

The four months of summer vacation was looked forward to by everyone. We usually went abroad, or to Washington, D. C. In 1924 I was asked by Dr. Mario Calvino, the Director of the Cuban Agricultural Experiment Station in Santiago de las Vegas near Habana, to work out a number of problems during the summer months, including the hydrocyanic acid content of certain varieties of the Cassava. While engaged in this work I became acquainted with Señora Dr. E. Mameli Calvino, the wife of the director who was a brilliant plant physiologist. I also met Dr. Gonzalo M. Fortun, who became later Director of the Station, and Dr. J. T. Roig y Mesa who is thoroughly versed in economic botany. I also met Dr. J. B. Acuña and Dr. S. C. Bruner of the Department of Plant Diseases. They all advised me that I should become acquainted with Dr. Hermano Leon (J. S. Sauhet) of Colegio de la Salle in Vedado, Habana. After meeting this eminent man I found out about his great knowledge of the flora of Cuba, about which he wrote many publications. Ever since, I have kept up correspondence with this fine man.

During the summer months of 1928 and 1929 we were in Washington, D. C., where I acted as Bibliographer of the Tropical Plant Research Foundation under Dr. W. A. Orton, previously known for his work in plant diseases. It was my work to make reports and make a card index in relation to crops that were being grown in the Netherlands East Indies, especially in relation to sugar cane and coffee. Most of the study was done in Dutch publications in the Library of the U. S. Department of Agriculture, the Library of Congress, and of the Pan American Union; where I became later on acquainted with Dr. J. L. Colom, Chief of the Division of Agricultural Cooperation. During that time I watched Dr. Orton studying the Spanish language, and I got the idea of taking courses too in that language—which I took at the Berlitz School. This became useful to me when I later went to Latin American countries. When getting my mail in 1928 at the Netherlands Embassy one day, I was pleasantly surprised with a package that came from Bulgaria. It contained an autographed photograph from His Majesty Boris III, King of Bulgaria with whom I had corresponded for a number of years. He is a lover of natural sciences especially of botany. Several years later when

the King married Princess Giovana of Italy, I also received a photo of the Queen being exactly of the same oval shape and size as the photo of the King. During our stay in Washington we had many pleasant hours at the Netherlands Embassy where we were entertained by the successive Ambassadors Dr. Van Roijen Jonkheer van Haersma de Witt and Dr. Loudon.

The summer of 1930 arrived and we made a trip to Holland to visit my father. My mother had died a few years previously. I was pleased to meet again Professor Hugo de Vries who lived in retirement in Lunteren (Gelderland). I renewed my friendship with Dr. August Chevalier at the Jardin des Plantes in Paris who is an expert on tropical agriculture and of economic plants of the French Colonies. I visited the people at the Botanical Institution in Berlin-Dahlem. I did some studies in the herbarium now largely destroyed during the war. For some time our family was entertained at the Castle of Dr. Fritz Graf van Schwerin in Thyrow. He was for many years President of the Deutsche Dendrologische Gesellschaft (German Dendrological Society) of which I was made Corresponding Member a few years previously. The Count, Countess and their two sons were most charming and entertaining. The Count showed us his extensive estate and above all his widely known collection of trees and shrubs in his park. There were also a number of hybrid *Amaryllis* and *Crinum* species in some of his greenhouses. Later during that vacation I attended the International Botanical Congress at Cambridge, England, and of course visited the folks at Kew.

The summer months of 1932 were spent entirely in Colorado Springs, Colorado, where I could compare my observations on alpine plants with those made in Switzerland. During that year, I received a letter from Prof. H. Harms in Dahlem, asking me to prepare some families for the second edition of Engler und Prantl, *Die Natuerlichen Pflanzenfamilien*, one of the largest botanical works, to be published in at least forty volumes. Thus far my *Sarraceniaceae* and *Cyrillaceae* have been published while others will follow. In my early days, I had always hoped to own the first edition of this gigantic work but I never imagined that I would be asked to become a co-author of the second edition. With these activities became associated many pleasant memories of friendship with Mr. Wilhelm Engelmann, the publisher of this work, who is a born Hollander from Utrecht.

BULGARIAN VISIT

The year 1936 gave again some notable events. We went first during the summer vacation to Washington, D. C., where we were invited by Dr. Dimitri A. Naounoff, Ambassador of Bulgaria to receive in name of King Boris III, the Officer Cross of the Bulgarian Order of Civil Merits. During the lunch at the Legation the Ambassador was delighted to hear that we were going to Europe during the summer, and that it was my intention to visit his country Bulgaria. I was invited by the King through a letter of Dr. Ivan Buresch to come to Sofia. I went first

by boat to Holland, hence by the Orient Express via Vienna and Budapest to the capital of Bulgaria. Upon arrival I was soon received by Dr. Ivan Buresch, Director-General of the Royal Biological Collections who introduced me to a number of scientists of the Court including Dr. Nocolai Stojanoff, Botanist to the King and Professor of Botany at the University of Sofia.

During a certain morning an officer approached my room of Hotel Slavienska Beseda handing me a note in German from Dr. Buresch, that this morning he would present me to His Majesty at the Summer Palace in Vrana near Sofia. When passing the guards at the gate, I noticed the King standing at some distance in the park where he was waiting. After introduction, he thanked me for the many things that I had done for him. He took me through the park [Fig. 4] where he showed me his large plant collections in which he took a great pride. The first visit lasted from 9 to 12 o'clock in the morning. I had to see his large rockery gardens which he called "Klein Dahlem" (Small Dahlem). This he laid out when he was young and still a Prince together with his brother Prince Cyril and his sister Princess Eudoxia, under the guidance of Mr. Johann Kellerer, an Austrian who was his horticulturist and to whom the Royal Family was very much attached, already from early childhood. In the collection there was an Orchid; it was a yellow flowering *Orchis sambucina*. I very well remember that King Boris told me he hoped that the plant would still be flowering when I arrived.

After a long trip through the garden and the greenhouses, including a beautiful *Victoria regia* house with tropical water plants, and houses with Orchids which I had the honor to enrich with Orchids later from El Salvador and Guatemala, he finally showed me the palace. There were many pictures and paintings of his youth, all showing his love for the study of nature. The King asked me many questions in an interesting way about Holland and the United States and he told me much about his Bulgaria. He also advised me about the many things I should see when in Istanbul, Turkey. The King is very witty and likes to crack a joke, especially about himself. In botany he is a professional and no layman by any means. Dr. Buresch and Ambassador Naounoff often told me that the King should have been a botanist.

When I left the King promised me that there would be one of his aut^s available for me to take a trip to the beautiful and wonderful Rilla Mountains and I would spend as his guest a number of days in the interesting Rilla Monastery. On the trip I was accompanied by Dr. Stojanoff who showed me around everywhere. There was an undisturbed nature with an unequalled grandeur. The beautiful forests, the mountain meadows with their Balkan flora were unique, with a background of high mountains everywhere. There is so much that I should mention, but how could I in such a short space. The readers will be interested to know that I noticed masses of flowering wild *Gladiolus illyricus* in the natural meadows. We drove through interesting villages in Macedonia and visited the markets with so many people in their native dresses; we

went along the valley of the Struma; visiting the Government Tobacco Experiment Station, for in this region they grow one of the finest tobaccos. I returned to Sofia after a week.

During the stay in the capital, I was able to see many private collections of the Royal Family among which are the Zoological Museum close to the Palace, containing an unusually fine collection of Balkan birds collected mainly by King Ferdinand who was an outstanding ornithologist. There was also the large Herbarium. On the labels attached to the sheets, I could read that a great number of the plants were collected under the name of the King and earlier ones under the name of Prince



Fig. 4. Dr. Uphof (left), and King Boris III, of Bulgaria (right), in 1936. The King is showing Dr. Uphof the plant collections in the Royal Park at Varna, near Sofia.

Boris. Elsewhere was a separate building with a large collection of insects which was mainly brought together by his father. In still another section of Sofia was the private Zoological Garden. It is a very great pity that these outstanding collections are not sufficiently known abroad.

I was happy to become acquainted with several botanists, most being members of the Bulgarian Botanical Society of which I was made Corresponding Member some years previously. I was among others introduced to Dr. D. Atanasoff, Professor of Plant Pathology at the College of Agriculture, and at that time Minister of Agriculture. He specializes in virus diseases of plants. He studied in the U. S. and in Holland. He spoke excellent Dutch. This was no wonder, because someone told me that the

Bulgarian Minister always spoke Dutch at home as his wife was a Hollander.

One day I was invited by the members of the Bulgarian Academy of Science on an excursion to the State Agricultural Experiment Station not far from Sofia. Here we saw the many experiments that were going on to improve the agricultural conditions of the country.

My journeys in the Balkans were extended to Istanbul, Turkey, and upon my return to Holland, also to Belgrad, Jugoslavia with its botanical institutions, and later several parts of Hungary and Austria were visited. There was time left to see Holland. We motored to many parts of the country.

LATIN AMERICAN VISITS

During the spring of 1938, I received a letter from Don. Walter Deininger asking whether I would like to come to El Salvador where I might be useful in giving advice on a number of agricultural matters. I would be engaged for the summer months by the Asociacion Cafetalera de El Salvador with headquarters in San Salvador, the capital. On the end of May I left New Orleans by one of the steamers of the United Fruit Company and arrived at Puerto Barrios, Guatemala. In Guatemala City, the capital I had the pleasure to meet Dr. Mariano Pacheco H., who was at that time Director of Agriculture. He showed me his lovely private collection of plants. The greenhouses were rich in species of Bromeliads, Orchids and Cacti and I regretted again, as in Bulgaria, that such collections are so little known abroad. He spoke excellent French. He also introduced me to the Minister of Agriculture who assured me that everything at the Department was at my disposal. I met Don Juan Antonio Alvarado, the author of two volumes of "Tratado de Caficultura Practica."

After some days I went by auto to El Salvador. In the capital San Salvador I was met by Don Walter Deininger and his wife. They have large coffee and sugar plantations and many herds of cattle. Frequently I was invited to their home and had the pleasure of meeting many prominent people of the country. Soon I was introduced to the officials of the Cafetalera—to Don Roberto Lopez Harrison the administrator; to Don Hector Herrera who was also President of the Banco Hipotecario; and to Don Agustin Alfaro President of the Cafetalera. There was also Don H. de Sola one of the wealthiest persons of the Republic. He has extensive coffee plantations, did much business with foreign lands and was Consul of the Netherlands. He did much for me.

Soon I got to work at the laboratory of the Cafetalera in Santa Tecla. I had to work out the distribution of the dreaded root disease of the coffee trees. I found that it was caused by a *Rosellinia*. This work brought me by auto, train or on mule back to all the important coffee growing districts and towns. Further I was asked to make some observations as to the possibility of growing new crops that could be grown at various altitudes and with which they could start gradually experi-

menting later, for El Salvador is a one-crop country, its interest being mainly in coffee. They asked me also to write up an outline with suggestions of courses that might be given in agriculture at the Universidad Nacional.

It seemed that the El Salvadoreans could not do enough for me; everywhere I was invited to parties. I had to visit their fincas (coffee plantations), had to go through their collections (hobbies) and see their libraries. Through an invitation of Don Hector Herrera, I was enabled to attend a banquet and ball at the Country Club where there were the members of the diplomatic corps. There I had interesting talks with the Vice President of the Republic and with the Ministers of Foreign Af-



Fig. 5. Dr. Uphof at the age of 65 years.

fairs, of War and of Agriculture. The better classes, as in Guatemala, practically all know English, French and German in which they can converse easily. They are cultured and widely travelled. I regretted to leave this hospitable El Salvador. Upon my way back to Florida, I again visited different parts of Guatemala and some sections of Honduras, especially the banana plantations.

When World War II broke out, I became in 1942 Economic Botanist to the Board of Economic Warfare in Washington, D. C., where I had to make reports and give advice about rubber producing plants native to the New World, and of some other crops that might be of some value during the conflict. Toward the end of the war, I did similar work for the Board of the Netherlands Indies under Dutch officials in New York City.

After the war, we settled in Tampa, Florida, where we bought a

home and alternated the work at the University of Tampa with activities in Guatemala. To this Central American republic, I was invited by Don W. E. Dieseldorff, prominent plantation owner in Coban in the Departamento of Alto Verapaz. I reached this city from Tampa by plane. The gentleman has in this section of the country numerous plantations. Most were planted with coffee trees; others with maize and some with allspice. In the warm regions, especially in Cubilquitz were plantations with pepper vines (*Piper nigrum*), cardamon and nutmeg. Others were planted with cacao trees. This demanded from me many interesting trips, most were undertaken on mule back through beautiful Guatemalan mountain scenery; through virgin forests; along rivers and lovely mountain lakes. During these trips there were always species of *Zephyranthes* to be noticed, usually growing in extensive groups. Often I could enjoy the Hybrid *Amaryllis* grown in the private gardens. Along the roads, we frequently noticed Indians balancing large baskets on their heads, containing fruits and vegetables and often there were one or more bunches of *Amaryllis* flowers that were to be sold on the markets of Coban, San Pedro or San Christobal; for the Guatemalans are great lovers of flowers.

Everywhere in the mountains there were hosts of species of Orchids, growing as epiphytes against the trees. Many had gorgeous flowers including species of *Stanhopea*, *Epidendrum*, *Oncidium*, *Odontoglossum*, *Maxillaria*, *Lycaste* and numerous others. *Lycaste Skinneri* (not *Cattleya Skinneri* as some claim) is the state flower of the country. These all excited me very much, as I knew many from the collections in Europe. Equally as interesting were the many species of bromeliads; some were very tall, growing likewise against the trees.

My research work remains to be mentioned briefly. I published my papers in some American journals, and also in British, Dutch, French, German, Austrian, Spanish, Italian, and Japanese publications. As for the Japanese, I wrote the manuscript in English or German and through the kind help of Prof. Tyozaburô Tanaka in Japan they were translated into his own language.

HOBBIES

Though naturally, I consider botany my hobby, I have also some others as well. I am a stamp collector, specializing in stamps of the Netherlands which I keep complete by adding new issues. Further I have a collection of minerals, among which I have several uranium and radium ores; they all fit in a collection of specimens of around 2 x 3 inches in size. I also collect coins namely Ancient Roman coins and also crowns under which are understood silver coins about the size of a silver dollar of which I have many.

I have a fine private botanical library, and I have not overlooked the older works, like those of Fuchs, Clusius, Linnaeus, Commelin, Boerhaave, Tournefort, Munting, Chabraeus, Barrelier and others, published between 1512 and 1800.

EDITORIAL NOTE.—Dr. Uphof has published no less than 335 articles in the field of plant science. This bibliography is too long for reproduction here, but Dr. Uphof will be pleased to send the 11-page mimeographed list of titles to anyone requesting it. Dr. Uphof's address is 2903 San Nicholas Street, Tampa, Florida.

CORLISS' "HEMEROCALLIS—THE PERENNIAL SUPREME"¹

W. R. BALLARD, *Maryland*

This is the latest addition to the relatively few comprehensive publications devoted to this popular perennial. The historical section gives a broad picture of the development of the daylily from the first recorded hybrid by Yeld down to the host of hopeful contemporary growers of seedlings.

Analysis of the leading varieties contending for popular favor is considered from the standpoint of regional performance and needs. In a country as large as this with such varying climatic conditions, it is essential to evaluate varieties in the light of how they succeed in each distinct area. Development has been rapid in some sections but in others little is known about the remarkable improvement which has been made in this flower in recent years.

The cultural directions given for the daylily are adequate. Fortunately the adaptability of this showy flower is such that it presents few problems in its culture. Gardeners will appreciate the suggestions made as to the use of the daylily for landscape effect both in the home grounds and in public plantings.

Considerable attention is devoted to the use of the daylily in flower arrangements. This phase of its use has not developed to the extent that its value warrants. It is to be hoped that a recognition of its merits will stimulate greater efforts to develop varieties whose flowers remain in good condition for arrangements made for use in the evening.

This book is notable for its fine illustrations as might be expected of an author who is also an accomplished photographer. These are further enhanced by the high quality of the paper upon which they are printed. Those who are interested in photographing the daylilies in their own garden and especially those who wish to have pictures of their own origi-

[Ballard—CORLISS' "THE PERENNIAL SUPREME," continued on page 31.]

¹*Hemerocallis—The Perennial Supreme*, by Philip G. Corliss, M.D., 1st ed. Foreword by Sydney B. Mitchell. San Francisco, Calif. 1951. \$7.50. This book may be obtained from the author at Somerton, Ariz.



Hybrid *Amaryllis* Display at the Cleveland Flower Show, 1951

Plate 2

I. REGIONAL ACTIVITY AND EXHIBITIONS

CLEVELAND FLOWER SHOW—AMARYLLIS DISPLAY 1951

THOMAS R. MANLEY, *Horticulturist*

The Garden Center of Greater Cleveland and Western Reserve University

Public enthusiasm for the initial display of Royal Dutch Hybrid Amaryllis in the 1950 Cleveland Flower Show as staged by the Garden Center of Greater Cleveland and Western Reserve University, caused the show committee to provide one of the feature locations for 1951. Thus a 150-foot frontage with a depth of 12 feet was staged with amaryllis [Plate 2]. Over 200 8-inch pots were used amid ferns and Hahn's ivy. Cultural methods this season provided most plants with four to six leaves which added to the display, screening the nakedness of the scapes.

The background of arborvitae, *Thuja occidentalis*, screened the walls while forced Morrow Honeysuckle, *Lonicera morrowii*, with pale green foliage and yellow flowers, and rosy Tartarian honeysuckle, *Lonicera tartarica rosea* with rose flowers, 6 to 8 feet tall, lightened the deep color of the arborvitae.

Central figure of the display was a life-sized nude in bronze, standing amid ferns and white amaryllis. Blending from white toward the sides of the display were white amaryllis striped with pink and scarlet, featuring the varieties KING OF THE STRIPES (Warmenhoven) and STRIPED BEAUTY (Warmenhoven). Blending to pink and rose were PINK PERFECTION (Ludwig), FANTASY (Ludwig), DORIS LILIUM (Ludwig) and VIOLETTA (Warmenhoven). Blendings of salmon, orange scarlet, scarlet to red, with deep wine red highlighting the ends were provided by the varieties MYSTERIE (Warmenhoven), RED MASTER (Warmenhoven) and MORENO (Warmenhoven) with tall scapes bearing huge flowers.

The foreground varieties featured the miniature form *xAmaryllis* "gracilis" (DeGraaff strain) causing much comment due to their small size and unique form. The show was attended by 186,000 people and once again by popular acclaim designated the amaryllis display as one of the highlights of the show.



The 1951 AMARYLLIS QUEEN of New Orleans. See legend bottom opposite page.

Plate 3

[Ballard—CORLISS' "THE PERENNIAL SUPREME," continued from page 27.]

nations, will be interested in the helpful suggestions for staging and taking photographs.

Lists of recommended varieties are always interesting but in a group undergoing such a rapid evolution as is the daylily they soon lose their value. Dr. Corliss' lists will no doubt prove of value to growers when selecting new varieties if due allowance is made for climatic variations and for personal tastes. The lists of hybridizers and gardens where new varieties may be seen in bloom are valuable. Fortunate are the gardeners who have the privilege of seeing new varieties in bloom and growing under similar conditions to those existing in their own garden. This is a much more satisfactory way to make selections than to try to figure out from printed descriptions what varieties will make valuable additions to one's collection.

This attractive book by Dr. Corliss will be welcomed by all those interested in the daylily. It gives in simple, non-technical language information which should do much to increase in readers an awareness of the modern development in the daylily, and to stimulate interest in its greater use.

NEW ORLEANS AMARYLLIS SHOW, 1951

MRS. W. D. MORTON, JR., *Pres. Garden Circle, New Orleans*

The Third Official Amaryllis Show of New Orleans was again staged on the entire ground floor at the Jewish Community Center, 5342 St. Charles Ave., on March 31 and April 1, 1951. The Amaryllis were never lovelier. New Orleans Garden Clubs were represented in both artistic arrangements and bloom exhibits. The awards were made by six accredited Judges—two silver cups, five APLS awards, two Club ribbons, and ten additional prizes.

On Saturday afternoon Miss Gayle Mackenroth, daughter of Mr. and Mrs. Richard A. Mackenroth, was crowned the 1951 Official Amaryllis Queen of New Orleans by Park Commissioner Victor H. Schiro [Plate 3]. Her maids were Misses Jimmy Mackenroth and Janice Collins. Miss Marilyn Favret, last year's Queen, presented Miss Mackenroth and her Court of Maids.

Plate 3. (See opposite page.) The 1951 Amaryllis Queen of New Orleans, Miss Gayle Mackenroth (center) is crowned by Park Commissioner Victor H. Schiro (rear, left) during the 1951 ceremonies. Her maids are Miss Jimmy Mackenroth (front, left), and Miss Janice Collins (front, right). Miss Marilyn Favret, last year's Queen (rear, right).

1951 ORLANDO - WINTER PARK HEMEROCALLIS SHOW

WYNDHAM HAYWARD, *Southeast Regional Vice President,
Winter Park, Florida*

The Mead Botanical Garden in Orlando - Winter Park was the scene of its main Daylily show of the season May 27, 1951, when Central Florida Hemerocallis growers exhibited their choicest blooms for the delight of the good-sized attendance of flower lovers.

There were half a dozen growers and hybridizers who showed their blooms, and among them were some of the nation's finest new hybrids of the Daylily, varieties which are expected to take high rank as daylily favorites of the future.

Outstanding among the flowers on view were some of the named varieties of R. W. Wheeler, Winter Park, nationally known and recognized breeder of Hemerocallis, and his notable group included his sensational purple-black RAVEN, the lovely yellow ARLA, the showy orange NARANJA, the huge ruffled SHOW GIRL, the wine colored BACCHUS and AMHERST, and his pastel novelty LILAC TIME.

Other varieties that he showed were MARTHA WASHINGTON, SABRINA, BRASSY SUN, TIARA, VEGA, DEMI-TASSE, TOM THUMB, TOMOKA, MOHAWK, HAILE SELASSIE, VICTORIA, PAUL IHRIG, BALLET GIRL, SCORPIO, OHRED, RUBY SUPREME, SCARLET SUNSET, BERCEUSE, GANYMEDE, HAZEL SAWYER, BILLIE BURKE, BRACKEL, MING TOY, CHANTICLEER, TYROL, BRANDYWINE, BLACKHAWK, ROYAL LADY. He also showed 44 unnamed seedlings.

Mrs. C. M. Slaughter of Orlando showed 46 seedlings, and the named variety FRANCES WYNN. Mrs. E. W. Landis of Deland showed 41 seedlings. Mrs. Robert Wall of Clarcona exhibited OLD ROSE, FRANDERS, KANAPAHA, PATRICIA, LIMELIGHT, PEACH BLUSH, BIJOU, BLANCHE HOOKER and 18 seedlings. Frank Vasku of Winter Park showed 30 unnamed seedlings in a variety of shades.

Soper's Gardens presented a colorful display including many of the Russell varieties of daylilies from Texas, including ELAINE RUSSELL, JOY RUSSELL, FLAMING SWORD, EL CAPITAN, MARQUITA, LINDA, EVANGELINE, HYPERION, KATHLEEN, CITY OF SUMTER, GOLD EMPIRE, SAN PEDRO, BAGUETTE, OPHIR, CHINA ROSE, DAWN OF DAY, QUEEN OF MONTEREY, ON TOUR, BATTLE CRY, TWINKLE, BABY TEARS, TEJAS, COLLEEN, RUSSELL'S MINUET, MARY GRACE, THE REVIEWER, BURNING STAR, PERFECT DAY, SPRING DELIGHT, RED GEM, LEST YOU FORGET, PLAY TIME, HAVEN, WESTERN JEWEL, LONE SYMBOL, GOLDEN BELL, PATRICIA, INDIAN DANCE, GYPSY, LITTLE BLOSSOM and MYKAWA.

Triple F Gardens of Orlando, operated by Mr. and Mrs. Gerald F. Knight, offered 15 seedlings, and named variety flowers including GYPSY, AMARYLLIS, CALYPSO, BRANDYWINE, HAILE SELASSIE, BABBETTE, PRISCILLA,

BAY STATE, CROWN OF GOLD, DR. REGEL, FLORHAM, CLARICE, OPHIR,, NARANJA, BALLET GIRL, HYPERION, SWEETBRIAR, CONFUCIOUS, MRS. TIGERT, SKYLARK, PRINCESS, AJAX, QUEEN OF MAY, CINNABAR, BARONET, PRIMA DONNA, PURPLE WATERS, SPRING PARADE, RUBY SUPREME, BIJOU and SYLVIA. Also their own introductions, GALLANT KNIGHT and LENA TYSON.

Wyndham Hayward of Lakemont Gardens, Winter Park showed several of his latest varieties, including the new red, HAYWARD'S SALOME, the new yellows, BETTY GRABLE and PAULA WAGNER, and others of his hybridizing: GLAMOUR GIRL, E. W. YANDRE, SALMON ROSE, EMPEROR JONES, CLARENCE, MINNIE, ZULU BOY, FLORIDA, SAHARA SUNSET, PRETTY QUADROON, and varieties of other breeders as RUBY SUPREME, DUCHESS OF WINDSOR, CABALLERO, CHERRY, CHISCA, JUNE BOISSIER, GOLDEN WEST, STAR OF GOLD, RAJAH, GOLDEN GLOW, BLACK HILLS, THE DIRECTOR, PATRICIA, PURPLE SAGE, BERTRAND FARR, ROSY DAY, BICOLOR, LIDICE, PURPLE WATERS, GEORGIA, ROSE GEM, RUBAIYAT, DR. STOUT, PRINCESS.

GARDEN VISITS, 1951

PHILIP G. CORLISS, M.D., *Southwest Regional Vice President
Somerton, Arizona*

In addition to the gardens visited during the Joint Meeting described elsewhere, I enjoyed a morning with my cameras at the wonderful gardens on the grounds of the Huntington Museum in San Marino, California. Two of the gardens are particularly outstanding: the cactus garden and the Oriental garden. The rose gardens are outstanding, and in season, the rhododendrons and azaleas are notable. The climate here is favorable to outdoor orchid culture, and large beds of cymbidiums were in full bloom.

In early June I attended the annual meeting of The Hemerocallis Society in Little Rock, Arkansas. Mr. Joseph House, President of the Society, and Mr. Walter Vestal, noted nurseryman of Little Rock, were hosts to the meeting, which attracted more than two hundred members from all parts of the country. At Mr. House's country place, "Flower Acres," there were more than three acres of hemerocallis seedlings in full bloom. Mr. Vestal had peak bloom on hundreds of guest plants of named varieties and his own and Mr. House's seedlings at his home garden in North Little Rock.

On the return trip from Little Rock I spoke to the Houston (Texas) Bulb and Amaryllis Society after a pleasant day visiting some of the fine Houston gardens. Noteworthy were the gardens of Mrs. Robert Schlumpf, past Hemerocallis chairman for the Texas Garden Clubs; Mrs. G. B. Reneau, landscape consultant; and Mrs. J. Willis Slaughter,

whose annual Houston Bulb Mart has for many years spread interest in amaryllids and other bulbs.

Mrs. Corliss and I left Arizona on the morning of July 4th with the hope of reaching Boston in time for the regional meeting of Region 4 of The Hemerocallis Society, which had been advanced to July 13 and 14. We covered 3500 miles in eight days, and spent five of the eight days in gardens of hemerocallis growers. Most important stops were with the Allen Wilds in Sarcoxie, Missouri; F. E. Rice and D. N. McKeithan in Bartlesville, Oklahoma; and Mrs. J. F. Emigholz, in Cincinnati, Ohio. Mr. Wild introduces the daylilies of Mr. Lemoine Bechtold and Mr. Carl Carpenter and grows the best of many other hybridizers. The Bartlesville gardens have contained most of the best new introductions for many years. Mrs. Emigholz is one of the most important hemerocallis hybridizers, and her introductions have long been favorably known.

An interesting stop was at Eastford, Connecticut, to see and photograph the new hybrid gloxinias of Albert Buell.

The New England meeting was well attended and blessed with good weather. The gardens visited will be those which will be seen at the annual meeting of The Hemerocallis Society in 1952, and included those of Mrs. Thomas Nesmith, Mr. Harold Knowlton, Mrs. Irving Fraim, Mr. Orville Howe, and Mr. Stedman Buttrick.

On July 28th Mr. Harold Knowlton took me to Professor Stephen Hamblin's interesting garden on Cape Cod, where we saw his tall hybrid hemerocallis. These are seedlings of two crosses: *H. altissima* × HYPERION and *H. altissima* × *H. fulva* (red clone). It is not certain whether this *H. altissima* is the same as Dr. Stout's *H. exalta*. Among the seedlings of the first cross are many recurved yellow flowers of nice form. The offspring of the second cross show a predominance of the red color (yellow is generally thought to be dominant in hemerocallis breeding).

The outstanding characteristics of all of these hybrids were their height and the erect nature of the scapes. The flower scapes were from five to seven feet high, and there was not a single ascending or horizontal scape—all the more remarkable because of the light soil and hilly garden in which they were growing. The bloom was rather late, but the branching and number of buds were remarkable. I felt that many of the hybrids especially the HYPERION seedlings were night bloomers, although Prof. Hamblin had not thought so.

On my return trip to the west, I visited the charming New Hampshire garden of Mr. Howard Andros at Walpole, and the large plantings at Mr. Richard Johnson's Shrewsbury Gardens in Cuttingsville, Vermont. Hemerocallis were thriving in both locations.

Wayside Gardens in Ohio, and the splendid gardens near Chicago of Mr. David Hall and Mr. Elmer Claar were also the object of study. The Kraus varieties at Faribault, Minnesota, were a bit past their peak, but still interesting.

A notable garden was that of Mr. Lemoine Bechtold in Denver. The

named varieties were past, but the seedling garden was in heavy bloom. His growing season is short, but Mr. Bechtold has produced some of our finest *hemerocallis* varieties in Denver.

In Portland, Oregon, I enjoyed making the annual garden tour with the Portland Men's Garden Club (largest in the world), one of the highlights of the tour being a demonstration of the new Kraus hardy chrysanthemums in the display gardens at Lewis and Clark University, with Dr. E. J. Kraus for guide.

My first object on reaching San Francisco was to see if the *hemerocallis* in the Fleishhacker garden were blooming in their fog and shade—they were!

[HERBERT MEDAL CITATION, continued from page 6.]

It should be noted that during the 14 years since 1938, the correctness of Dr. Uphof's findings have been widely recognized, and these have stimulated renewed interest in the group. It is interesting, in this connection, to note that no less than 9 new *Amaryllis* L., species have been proposed since that date—*Amaryllis kromeri* Worsley (Brasil), *Amaryllis aglaiae* Castellanos (Argentina and Bolivia), *Amaryllis ferreyrae* Traub (Peru), *Amaryllis fosteri* Traub (Brasil), *Amaryllis espiritensis* Traub (Brasil), *Amaryllis vanleesteenii* Traub (Surinam), *Amaryllis viridorchida* Traub (Brasil), *Amaryllis oconequensis* Traub (Peru), and *Amaryllis maracasa* Traub (Brasil).

In recognition of his important contributions toward the advancement of the *Amaryllidaceae*, the 1952 WILLIAM HERBERT MEDAL has been appropriately awarded to Dr. Uphof. It goes to him with the good wishes of all who know him as a reward for an important job well done."

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 182.]

papillose, both the stamens and style yellow; capsule not seen by me.—Flowering in November in rocky woods at Teneria, alt. 3000 m., Bolivia (Herzog no. 2486).

Zephyranthes cubensis Urb., Symb. Antill. 5: 292. 1907.—Related to *Z. carinata* Herb. (Bot. Mag., pl. 2594, from Mexico), but differing especially in its leaves being 2—3 times broader, the spathe mostly surpassing the ovary, the corolla half again as long, the tube of the perianth 3 times longer, 10—14 mm. long. *Z. rosea* Herb. differs in its much broader leaves, shorter spathe, smaller perianth, and more or less globose ovary.

Zephyranthes porphyrospila Holmberg in Fedde, Repert. 3: 94—95. 1906.—Argentina (San Luis along the shores of Rio 5° ?—Formosa?) Cultivated in Buenos Aires, blooming on the 20th day of January. This species resembles slightly *Z. robusta* (Herb.) Baker. It differs, however,

[Moldenke—AMARYLLID GENERA AND SPECIES, continued on page 98.]



Alstroemeria pelegrina L., after Feuillée, 1714.

2. SPECIOLOGY

[EVOLUTION, DESCRIPTION, CLASSIFICATION AND PHYLOGENY]

A REVIEW OF THE GENUS **ALSTROEMERIA**J. C. TH. UPHOF, *Tampa, Florida*

The genus *Alstroemeria* forms an extremely interesting group which is placed with the Amaryllids by earlier authorities, but is recognized as a genus in the family *Alstroemeriaceae* by Hutchison (Fam. Flow. Plants, vol. 2, 1934). In recent years *Alstroemeria* species have become important in ornamental horticulture.

The name was founded by Carolus Linnaeus¹ who dedicated it to his friend Alstroemer. In his "Amoenitatis Academicae" he mentions three species—*A. pelegrina*, *A. ligtu* and *A. salsilla*. The last named has been transferred to the genus *Bomarea*. Linnaeus presents a rough illustration of the first species on page 247 of his work.

These species had been described by Père Feuillée about half a century previously in his interesting book on South America.² Apparently Linnaeus obtained seeds from this missionary through Alstroemer via Cadiz.

Père Feuillée described these three plants under the name of *Hemero callis*. His descriptions which were in French were for those times quite detailed, although they are not up to the present requirements of a modern morphological description. The three plates are clear and the plate of *A. pelegrina* is here reproduced [PLANT LIFE plate 4], since it has some historical value in the study of this genus.

The first species mentioned by Feuillée is given the name of "Hemero callis floribus purpuracentibus striatis vulgò Ligtu." He illustrates the plant in plate IV of his work. This is the second species recognized by Linnaeus which he calls *A. ligtu*. Feuillée states at the end of his description that this plant is found along streams. He observed them along the river that passes through the center of the city of Conception in the Kingdom of Chile.

¹Carolus Linnaeus, *Plantae Alstroemeria*, in *Amoenitatis Academicae*. Tom. VI; 247-262, Upsalae, 1762.

²R. P. Feuillée, *Journal des Observations physiques, mathématiques et botaniques*. Tom. II; 710-714, Pl. IV, V, VI, Paris, 1714.

The second species he names "Hemerocallis floribus purpurascenibus, maculatis vulgò Pelegrina," with an illustration in Plate V. It was this species to which Linnaeus gave the name of *Alstroemeria pelegrina* and of which he too gives an illustration in his "Amoenitatis Academiae." In the second edition of his "Species Plantarum"³ we find this species mentioned first. This species is therefore the type of the genus. Here I wish to add, however, that in my personal copy of "Species Plantarum" the two names are spelled *pelegina* and *Ligta*. They are no doubt printer's mistakes. At the time Père Feuillée visited Chile this species might have been cultivated by the natives, for he states that the flowers of the plant deserve on account of their beauty a place in the gardens of the Incas and likely he would have seen them there at the right season, if he had lived there at that time. Feuillée is well aware of some of the morphological characteristics of the thickened roots. He mentions that the "Hemerocallis" which he described here are like a bunch of turnips. "The Spaniards of Peru" he says "have given this flower the name of Pelegrina, which means exquisite." They are found on a mountain in the North of Lima, a mile distant from this city."

The third species indicated by Feuillée is "Hemerocallis scandens, floribus purpureis vulgò Salsilla." Linnaeus gave it the name of *Alstroemeria salsilla* which was later on transferred by Herbert to the genus *Bomarea*.⁴

It should be noted that Linnaeus used the vernacular names that were cited by Feuillée.

There is no doubt as to what is understood under *A. pelegrina* L., as the type species, though the name is occasionally written as *A. peregrina* Ruiz et Pav., in fact William Herbert gives this same name. There is, however, some confusion as to what is understood under *A. ligtu* L., a species which at times has been confused with *A. caryophyllaea* Jacq., by Linnaeus' son and others. Herbert was also aware of this fact when he states on page 92 with the description of *A. ligtu*⁵: "The name was by a great and unaccountable error in the Bot. Mag.⁶ applied to a tropical plant, in no manner resembling it, which has been cultivated under a wrong name, being properly *A. caryophyllaea* of Jacquin." Under the description of *A. caryophyllaea* he explains, "This plant is generally known to cultivators by the erroneous name of "ligtu," given through great inattention by Mr. Curtis, for it has no affinity to the "ligtu" of Feuillée which he states is a Chilean plant." There is also evidence that *A. ligtu* has been mistaken for other species. This may be of interest since it is one of the earliest known species.

³Carolus Linnaeus, Species Plantarum. ed. sec. Tom. I: 461-462, Holmiae, 1762.

⁴William Herbert. Amaryllidaceae. 110 London, 1837.

⁵William Herbert. Amaryllidaceae. 91 London, 1837.

⁶He means no doubt Curtis Botanical Magazine t. 125,

Ruiz and Pavon⁷ in a monumental work about the flora of Peru and Chile in 1802, mention 23 species. In this lovely folio work beautiful illustrations are included. Among their *Alstroemerias* are seventeen species that are now transferred to the genus *Bomarea* in accordance with the proposal of Mirbel⁸ who maintained that this genus differs from *Alstroemeria* by the division of the perianth of which the exterior members are not reversed; by the stamens which are straight and the capsule which is rounded and flattened at the base.

Mirbel, according to Herbert, was on the right track, but, as he stated, had not laid hold of the real differences.

Herbert⁹ recognized 29 species; among these we find a number of varieties. There are in this work a number of plates showing illustrations of a number of *Alstroemeria* species. The nomenclature he follows in some instances is different from that recognized at the present. He came to the conclusion that the variability among some of the species was of such a nature that it was difficult to put them under a proper arrangement. Herbert places the genus in the *Alstroemiaeformes*, a part of the sub-order *Hypoxideae*. These *Alstroemiaeformes* were, according to him, characterized by sepals and petals not respectively uniform and with petaline filaments excelling. This group included *Chaeradotia* Herb., *Alstroemeria* L., *Collania* Herb., *Sphaerine* Herb., and *Bomarea* Mirb. He divided the genus *Alstroemeria* into nine groups, without giving these groups scientific names. His grouping may serve as a basis for the foundation of subgenera by a future monographer of this genus.

Rafinesque¹⁰ in 1836 proposed the genus *Lilavia*, with *A. psittacina* Lehm. as the type. When describing *Priopetalum* another transfer from *Alstroemeria*, he states: "While de G. Amaryllis has undergone such a revision and division the akin G. *Alstroemeria* has been left untouched, although presenting striking anomalies, I therefore present this end the 2 next reformed Genera out of it, but there are probably more."

Herbert proposed the new genera *Collania* and *Sphaerine* by the transfer of species from *Alstroemeria*. In many modern works these two genera have usually been united with *Bomarea*, including the work of Pax and Hoffmann.¹¹ Apparently the boundaries of the genus *Bomarea* are far more liberal than those of *Alstroemeria*. Kraenzlin is of the same opinion when he states that the limitation of the species with *Alstroemeria* is too narrow and with *Bomarea* they are too broad.¹²

⁷Hippolyte Ruiz et Josepho Pavon. Flora Peruviana et Chilensis. Tom. III. Madrid. 1802.

⁸C. F. Brisseau Mirbel, Histoire Naturelle G  n  rale et Particul  re des Plantes. Tom. IX: 71-72, Paris, 1804.

⁹William Herbert, Amaryllidaceae. 56, 66, 88-103, 396-397. London, 1837.

¹⁰C. S. Rafinesque, Flora Telluriana. 4: 34-35, Philadelphia, 1836.

¹¹F. Pax und K. Hoffmann. Amaryllidaceae, in Engler und Prantl. Die Nat  rlichen Pflanzenfamilien. Band 15a: 425, Leipzig, 1930.

¹²Fr. Kranzlin. Amaryllidaceae quaedam novae v. criticae. Beibl. Bot. Jahrb. Nr. 112: 1-7, Band 50, 1913.

Since the publication of Herbert's monograph, many new species of *Alstroemeria* have been discovered and described. Kunth¹³ recognized 40 species. Baker¹⁴ records 44 species in his work on the Amaryllids. This work has become the starting point upon which a further study of the Amaryllids is based and therefore also of the genus *Alstroemeria*. In his key, he divides the species of *Alstroemeria* into rather artificial groups, namely Brazilian species, of which he distinguishes 20, and the Chilean species, including 24 species. Even at that time this division of all these known species was not correct, because there were *Alstroemerias* known from other parts of South America as well. The rest of his key is based mainly on the characters of the leaves and in a few instances on those of the umbel, the flower cluster, whether this is simple or compound. It can be readily understood that in a great many instances it is rather hard to identify species from the two localities alone, namely from Brazil or Chile. It should be noted that the habitat of the type species *A. pelegrina* L., which was originally indicated by Father Feuillée to come from a mountain north of Lima is indicated by Baker as "Hab. Chile, near Valparaiso &c."

Since 1888, 18 species have been proposed as new. The principal contributions came for Philippi and Kraenzlin. It is to be regretted that the description of a number of species is based on very flimsy and incomplete type material.

The present writer feels that a thorough monograph of this interesting genus is very much needed, but for such an effort, one needs to examine the original type specimens that are scattered in different herbaria of many countries. In these troublous times it is not possible to produce the needed monograph.

A well balanced monograph is also necessary from the standpoint of species descriptions. The descriptions of some species are too brief and incomplete and can hardly be sufficient, whereas those by others are very extensive, giving many interesting facts, also in relation to locality and distribution. There are furthermore a number of species whose relationship to others has not been discussed and it is difficult to determine this relationship when we have to judge from some of the descriptions alone.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGICAL RELATIONSHIPS

As far as known, all *Alstroemeria* species are native to South America whereas those of the related genus *Bomarea* extend from this Continent through Central America into the southern half of Mexico. This vast area has not been intensively explored. No doubt, still more *Alstroemeria* species will be discovered.

Up to the present, *Alstroemeria* species have been described from

¹³K. S. Kunth. *Enumeratio Plantarum omnium cognitarum secundum familias naturales disposita*. Tom. V: 758-781, Stuttgart, 1850.

¹⁴J. G. Baker. *Handbook of the Amaryllideae*, 153-162 London. 1888.

Peru, Chile, Brazil, Ecuador, Paraguay, Bolivia, Argentina; some have been recorded as far south as Patagonia. No plants have been mentioned from Colombia, Venezuela and the Guianas, though there is no reason to believe that they do not occur in these countries.

Apparently the center of distribution of the genus is Chile and adjacent territory. Some species have a wide distribution like *A. pelegrina* L. and *A. ligtu*; others are apparently endemic, among which are included *A. patagonica* Phil., and *A. nana* Rendle.

There are species that prefer swamps and marshy localities of the tropical zone, like *A. campaniflora* Hand.-Mazzet., from Brazil. *A. piauhyensis* Gard., seems to prefer shady woods, originally known from Piauhy, Brazil, whereas *A. plantaginea* Mart., was described from high hills of Minas Geraes. There are others that have adapted themselves to the desert regions of Atacama, Chile, among which are included *A. polyphylla* Phil., and *A. graminea* Phil. We notice that *A. nana* Rendle occurs along the slopes of Mt. Frias and the shingle beach of Lake Argentina in Patagonia. Of unusual ecological interest is *A. pygmaea* Herb., which is a high andean representative and likewise *A. Fiebrigiana* Kraenzl., which was originally described from rocky slopes in Southern Bolivia at an elevation of 3700 meters above sea-level.

DIAGNOSIS OF THE GENUS ALSTROEMERIA

Herbaceous perennials with rootstock or root-tubers. Roots thickened, sometimes fibrous, often containing a considerable amount of starch. Stems from 3 to 4 feet long (*A. brasiliensis*) to not more than an inch (*A. parvula*) or hardly visible above the surface (*A. pygmaea*). Leaves turned upside down or resupinate, due to the twisting of the base. Leafblade linear, linear-subulate, lanceolate to oblong-spathulate; those on sterile stems being better developed than on those that bear the flowers. Leafbase more or less sessile. Flowers surrounded by bracts, united into umbels or umbel-like inflorescences, from 2 to 3 flowered (*A. paupercula*) to 10 to 30 flowered (*A. aurantiaca*), seldom solitary (*A. pygmaea*). Bracts linear (*A. versicolor*) to oblong-spathulate (*A. chorillensis*); very minute (*A. apertiflora*) to large (*A. caryophyllea*). Flowers brightly colored, often spotted, more or less zygomorphic or irregular; the lower segment of the inner cycle differing in shape from the other two members as to size and coloring. The three segments of the outer cycle differing in shape from the three in the center. Perianth tube wanting; all segments being free. Stamens somewhat declinate, adnate to the lower part of the segments; frequently unequal; as long as the limb (*A. plantaginea*, *A. Burchellii*) or shorter (*A. platyphylla*, *A. violacea*). Filaments filiform; anthers small oblong, attached by the base. Ovary inversely conical, 3-celled. Each cell containing many superimposed ovules. Style filiform; stigma separated about half way down into three parts or lobes. Fruit a dehiscent, loculicidally 3-valved capsule, umbricate toward the apex. Seeds globose.

DESCRIPTION OF THE SPECIES

[Complete descriptions in English of the species preceded by the asterisk (*) are given in the text. The reader is referred to Baker, Handbook of the Amarylliae (1888), for the descriptions in English of the other species.]

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|--------------------------|--------------------------|------------------------|-------------------------|
| 1. <i>plantaginea</i> | 17. <i>caryophyllaea</i> | 33. <i>inconspicua</i> | *48. <i>bakeri</i> |
| 2. <i>isabellina</i> | 18. <i>monticola</i> | 34. <i>nivalis</i> | 49. <i>venustula</i> |
| 3. <i>stenopetala</i> | *19. <i>hassleriana</i> | 35. <i>paupercula</i> | 50. <i>lineatiflora</i> |
| *4. <i>radula</i> | 20. <i>foliosa</i> | 36. <i>rosea</i> | *51. <i>pavoniana</i> |
| 5. <i>cunea</i> | 21. <i>piukhyensis</i> | 37. <i>araucana</i> | 52. <i>chorillensis</i> |
| 6. <i>gardneri</i> | 22. <i>pulchella</i> | 38. <i>volckmannii</i> | 53. <i>crocea</i> |
| 7. <i>platyphylla</i> | *23. <i>damaziana</i> | 39. <i>violacea</i> | 54. <i>spathulata</i> |
| 8. <i>longistyla</i> | *24. <i>regnelliana</i> | 40. <i>ligtu</i> | 55. <i>crispata</i> |
| 9. <i>apertiflora</i> | 25. <i>scaberula</i> | 41. <i>parvula</i> | *56. <i>sotoana</i> |
| *10. <i>malmeana</i> | 26. <i>longistaminea</i> | 42. <i>nubigena</i> | *57. <i>patagonica</i> |
| 11. <i>sellowiana</i> | 27. <i>inodora</i> | 43. <i>philippii</i> | *58. <i>nana</i> |
| 12. <i>zamoides</i> | *28. <i>insignis</i> | 44. <i>pelegrina</i> | *59. <i>polyphylla</i> |
| 13. <i>brasiliensis</i> | 29. <i>pygmaea</i> | 45. <i>gayana</i> | *60. <i>modesta</i> |
| *14. <i>chapaensis</i> | 30. <i>revoluta</i> | 46. <i>haemantha</i> | *61. <i>graminea</i> |
| 15. <i>burchellii</i> | 31. <i>versicolor</i> | 47. <i>aurantiaca</i> | *62. <i>amazonica</i> |
| *16. <i>campaniflora</i> | *32. <i>febrigiana</i> | | |

1. *ALSTROEMERIA PLANTAGINEA* Mart. in Roem. et Schultes Syst. VII. 739; Herbert. Amaryll. 89. 1837; Schenck in Flora Brazil. III, 178, Plate 21, fig. 21; Baker Amaryll. 133. 1888.

According to Herbert this species was originally observed along high hills near Minas Geraes, Brazil.

2. *A. ISABELLINA* Herb. Amaryll. 86, 396. t. 6, f. 4-6; Baker Amaryll. 134. 1888.

Herbert records that a very fine specimen of this species had been received by Sir W. Hooker from Mr. Tweedie who stated that it is one of the most beautiful flowers to be encountered in Rio Grande where it is found among the mountain marshes and rough pastures. The plant is reported as abundant near Portalegro, Brazil.

3. *A. STENOPETALA* Schenck in Martius Flora Brasiliensis. III. I. 174; Baker Amaryll. 134. 1888.

4. *A. RADULA* P. Dusen, Species novae in "Serra do Itatiaya" Brasiliae indigenae II. Arch. Mus. Nac. Rio de Janeiro 13: 103, 1903. Fedde Repertorium novarum specierum regni vegetalis 7: 264, 1909.

Description.—Stem glabrous. Leaves lanceolate, short petioled, glabrous below. Leaves of the involucre shorter than the pedicels. Pedicels 4—8, glabrous. One-flowered. Members of the perigone entire, not always unguiculate. Sepals narrow lanceolate, glabrous; petals narrow bristle-like, produced to a point. Stamens as long as the perigone; filaments glabrous. Style as long as the stamens.

Notes.—Native to Brazil: Serra do Itatiaya in primitive forests, at an elevation of 1300 meters above sea level. Another specimen was found

by E. Ule along the margin of a primitive forest at 1850 meters. Flowers from January to May. This species is related to *A. stenopetala* Schenck., from which it differs in the petiolate leaves; the lobes of the perigone and the glabrous filaments.

5. *A. CUNEA* Vell. Flor. Flum. III t. 121; Seub. in Martius Brasiliensis III. 172. *A. schenckiana* Baker. Amaryll. 134. This species is closely related to *A. isabellina* Herb., and is native to Central Brazil.

6. *A. GARDNERI* Baker Journ. Bot. 1877, 261; Baker Amaryll. 134. 1888.

A native to Central Brazil, esp., the Province of Goyaz. Gardner nr. 4369.

7. *A. PLATYPHYLLA* Baker in Journ. Bot. 1877, 261; Baker Amaryll. 134. 1888.

This species most likely was collected by Gardner at the same time as *A. gardneri* because its field number is nr. 4368.

8. *A. LONGISTYLA* Schenk in Martius Flora Brasiliensis III. I. 173; Baker Amaryll. 134-135. 1888.

9. *A. APERTIFLORA* Baker in Amaryll. 135. 1888.

10. *A. MALMEANA* Fr. Kraenzlin in Amaryllidaceae quaedam novae v. critica. Beibl. Bot. Jahrb. 50; nr. 112: 3, 1913.

Description.—Rhizome creeping, horizontal; roots turnip-shaped, narrowly tapering toward the top, ramose, 3—4 cm. long, 7—8 mm. thick. Stem thin, slender to about 90 cm. high. Underground internodia 7 to 8, very short; internodia above the ground long. Leaves linear to linear-lanceolate, obtuse 5—8 cm. long, 6 mm. wide. Bracts of the inflorescences 2 to 4, very small, obtuse, 2.5 mm. long. Inflorescence 3-flowered, 2.5 cm. long; pedicels 1 cm. long, glabrous. Perigone 1.8—2.2 cm. long. Sepals linear, fimbriate, spathulate, acute, at the end, 5.5 mm. wide. Petals of equal length, at the base linear, glabrous, further up obovate-spathulate, short acute, apiculate, 9—10 mm. wide. Stamens 2.2 cm. long, style much shorter; ovary cone-shaped, 2.5 mm. long. Flowers are light red and appear in February.

Notes.—Native to Brazil: Rio Grande do Sul, Santo Angelo pv. Cachoeira, in a moist field. Exped. I. Regnell Malme nr. 554.

According to Kraenzlin this species is related to *A. apertiflora* Baker, a species which was also found among the plants of Regnell's Expedition nr. 1098 and nr. 2359. An important difference is found in the inflorescence which is here a "kurze dreistrahlige Dolde" (a short three-rayed umbel) which is five-rayed in the Baker species.

11. *A. SELLOWIANA* Seubert in Martius Flora Brasiliensis III. I. 173; Baker Amaryll. 135. 1888.

12. *A. ZAMOIDES* Baker Journ. Bot. 1877, 262; Baker Amaryll. 135. 1888.

13. *A. BRASILIENSIS* Spreng. Syst. II. 81; Baker Amaryll. 135. 1888.

Notes.—Herbert remarks "Brasiliensis (Sello) is much insufficiently described to be ever identified. It is supposed to be a variety of *Monticola*." According to Baker it is a native to Central Brazil, Provinces of Goyaz and Minas Geraes, gathered by Pohl and Sello.

14. *A. CHAPADENSIS* F. C. Hoehne, Monocotyledones, Amaryllidaceas. Anexo 5. Historia Natural. Parte V. Comissão de Linhas Telegraphicas Estrategicas de Matto-Grosso ao Amazonas. 18—19, Plate 81, 1915.

Description.—Rhizome more or less horizontal. Stem glabrous, subterete, more or less slender, slightly bending alternately in opposite directions, subventricose, partly slenderly tapering, erect, 15—20 cm. high. Leaves linear-oblong or oblong-subovate, blunt or rounded at the end, or acute, glabrous, submembranaceous, somewhat clasping around the stem, 6—7 cm. long, 1.5—2.2 cm. wide. Bracts of the involucre 4 to 6, linear-oblong, obtuse, subequal, 2.2—4 cm. long, 3—5 mm. wide. Inflorescence a terminal simple or slightly compound umbel, 5-flowered, glabrous, erect, angular. Perigone slanting erect, subhorizontal, funnel-shaped, 3.5—4 cm. long, at the top 2.2—2.5 cm. wide. Segments of the perigone obovate-subspathulate, unguiculate, above abruptly acuminate, subrounded; sepals yellow, apiculate; petals pubescent on the upper surface, yellow, suberect, margins recurved. Stamens much shorter than the perigone; filaments subsubulate, glabrous; anthers oblong, emarginate at the base. Ovary six-sided; style filiform, glabrous, remaining partly adhered to the fruit.

Notes.—From Brazil: "Cerrados" in Chapada Mts. at an elevation of 650 meters. Flowers appear in March. Herbarium nrs. 2964, 2965 and 4551.

Related to *A. brasiliensis* Spreng., from which it differs by the shape of the segments of the perigone and some other characteristics.

15. *A. BURCHELLII* Baker Journ. Bot. 1877, 262; Baker Amaryll. 135. 1888.

16. *A. CAMPANIFLORA* Heinrich Freih. v. Handel-Mazzetti, Amaryllidaceae in R. von Wettstein and F. Schiffer, Ergebnisse der Botanischen Expedition der Kaiserl. Akad. der Wissensch, nach Sudbrasilien 1901. Denkschr. d. Kaiserl. Akad. d. Wissensch. Mathem. Klassen. 19: 213-214, Taf. XIX, fig. 2-6, 1908. J. R. Sealy. Curtis Bot. Mag. Plate 9664, 1944. *A. butantanensis* F. C. Hoehne. Uma *Alstroemeria* nova dos arredores de São Paulo, Revista Museu Paulista 11: 483-488, 1 plate, 1919.

Description.—Rhizome 8—10 mm. thick with fleshy roots. Stem erect, 50—90 cm. high, glabrous. Sterile stems with shorter leaves than the fertile ones, shorter toward the base. Leaves 20 to 30, subsessile, resupinate, glabrous, narrow lanceolate to narrow oblong-lanceolate, glaucous, subcoriaceous, 6—15 cm. long, about 15 mm. wide, spreading

or ascending. Flower clusters a compound umbel, 10 to 20-flowered. Peduncles 10 to 25 mm. with the same number of bracts. Bracts and bracteoles 2—5 mm. long, much reduced; pedicels glaucous, 1.5—3.5 cm. long. Flowers tubular, 3.5—4 cm. long, yellow, greenish toward the base. Sepals glaucous, 3.5—4 cm. long, subequal, greenish inside; petals unequal, green furnished with dark brown blotches. Stamens 3.5 cm. long; anthers 8 mm. long. Ovary 5—6 mm. long, 7—2 mm. thick. Fruit a capsule, obovate, pyriform, 2.5 cm. long, 1.8 cm. thick. Seeds dark red, black toward the top, globose, 3—4 mm. thick.

Notes.—According to Handel-Mazzetti this species is closely related to *A. burchellii* Baker from which it differs by its longer leaves and its many flowered inflorescence, and larger flowers. His specimen was derived from São Paulo, Inter Rio Grande and Alto da Serra, at an elevation of 800 meters. Leg. M. Wacket, 1902, and Pion leg. Puiggari 1885. F. C. Hoehne who described this species under the name of *A. butantanensis* reports his plant from moist places near Butantan, São Paulo, where it flowers from November until December. The fruits mature from September to October. His herbarium numbers are nrs. 937, 1075 and 3068. Sealy relates that this rare species was introduced from Brazil through Major Pam in 1932. The plants flowered the following September. It grows in swamps and marshy places along the mountains between São Paulo and Santos. Sealy mentions that this species is related to *A. isabellina* Herb., both species having tubular flowers. Some authorities feel that it should be placed in the genus *Bomarea*.

17. *A. CARYOPHYLLAEA* Jacq. Schoenbr. VI. 33. t. 465; Herbert Amaryll. 89. 1837; Baker Amaryll. 136. 1888.

Notes.—This species is sometimes erroneously called *A. ligtu*, a mistake originally found in Curtis' Bot. Mag. plate 125, non Linn. It has no relationship to the *Ligtu* of Feuillée. Herbert mentions "In R. and Sch. the name *Curtisiana* is substituted; but I can see no reason for that, since the error had been long ago set right by Jacquin, who named it *caryophyllaea* on account of its fine fragrance, and there can be no doubt at all as to the identity of the plants." He mentions a variety under the name of *catharinensis* with very slender involucreal bracts; petals spotted upward.

18. *A. MONTICOLA* Mart. in Schult. Syst. VII, 739; Herbert Amaryll. 89; Baker Amaryllid. 136. 1888.

19. *A. HASSLERIANA* J. G. Baker, Amaryllidaceae in R. Chodat et E. Hassler, Plantae Hasslerianae soit énumération des plantes récoltées au Paraguay. Bull. de l'Herb. Boissier. 2 Ser. 3: 1101, 1903.

Description.—Stem 3—6 cm. high, moderately robust, striate, glabrous, erect, to the middle leafy, toward the base and top leafless. Leaves 10 to 12, sessile, lanceolate, 2—2.5 cm. long, 3—4 mm. wide, at the base attenuate, apex subobtusely, glabrous. Umbel 4 to 9 flowered; pedicels erect, glabrous, 1.5—2 cm. long; bracts lanceolate, leaflike, 1—1.5 cm. long. Perigone 1.3 to 1.4 cm. long; segments spatulate, 3 mm. wide,

white, dark tinted with greenish margins. Stamens as long as the perigone; anthers oblong; filaments filiform. Ovary turbinate, glabrous; lobes of the stigma short.

Notes.—Paraguay, from Tobaty nr. 6140. Plant. Hassl. I. p. 116. This species is apparently related to *A. monticola* Mart.

20. *A. FOLIOSA* Mart., in Schultes Syst. VII, 740; Herbert Amaryll. 91; Baker Amaryll. 136. 1888.

Notes.—G. Beauverd in *Plantae Damazianae Brasiliensis*, Bull. de l'Herb. Boiss. 2 Ser. 6: 587, 1906 mentions var. *floribunda* Beauv. Nr. 1553 from Alto do Itaculoni. Martius mentions in *Flora Brasiliensis* the following varieties: *angustifolius* Mart., with linear leaves and var. *humilior* Mart., with linear-lanceolate leaves. *A. foliosa* is a polymorphic species.

21. *A. PIAUHYENSIS* Gard. MSS.; Baker Amaryll. 136. 1888.

Notes.—A species related to *A. pulchella*. It has been recorded from shady woods near Veiras, Province Piauh, Brazil. Gardner Nr. 2324.

22. *A. PULCHELLA* L. f. Suppl. 206; Herbert Amaryll. 101; Baker Amaryll. 136. 1888; *A. psittacina* Lehm. Cat. Hort. Hamb. 1826, ex Schult. f. Syst. VII, 739; Hook in Bot. Mag. t. 3033; Lindl. in Bot. Reg. t. 1540; *A. banksiana* M. Roem. Syn. Ensart.

Notes.—J. G. C. Lehmann describes this species under the name of *A. psittacina* in *Plantas quasdam novas in Horto Hamburgensium Botanico cultas*, Linnaea 5: 372-373, 1830. It is apparently recognized under this name as a separate species in *Hortus Kewensis Suppl. VIII 1926-1930 (1933)*. Baker in *Amaryllid. 136*, recognizes the plant under the name of *A. pulchella* L. f. Herbert in *Amaryll. 101*, makes the remark that the type specimen has been much mutilated, especially as to the flowers. It was labeled in the hand-writing of Dryander and was supposed to be the plant indicated by Linnaeus f. in *Suppl. 206*. Linnaeus f. described his *pulchella* not from a specimen but from a drawing. It occurs to me that much has to be cleared up as to the nomenclature of this *Alstroemeria* species.

23. *A. DAMAZIANA* Gustav Beauverd, *Plantae Damazianae Brasiliensis*. Bull. de l'Herb. Boiss. 2 Ser. 6: 587-588, 1 fig. 1906.

Description.—Stem glabrous, erect, 70—135 cm. high; leafless upward from 10 to 15 cm. Leaves narrow linear-lanceolate, resupinate, acute, becoming very narrow toward the petiole; base semi-amplexicaule, glabrous, 3—7 cm. long, 3—5 mm. wide. Bracts of the involucre 8 to 12, linear unequal, 1.5—5 cm. long, 1—4 mm. wide. Umbel 3 to 8 flowered. Perigone horizontal, subfunnel-shaped, 4 cm. long. Segments of the perigone unequal, pink spotted with purple stripes over the length. Stamens subulate, shorter than the perigone, 15—30 mm. long. Style filiform, glabrous, 2—4 mm. long; stigma 3-cleft, erect or recurved, 3—4 mm. long. Ovary oblong, costate.

Notes.—Brazil; from Capovira near Ouro Preto. Nr. 1521 collected

by L. Damazio, October 1904. This species reminds one of *A. pulchella* L. f. and still more of *A. piauihyensis* Gardn., as to its habit, its umbel and the irregular flowers. On account of the characteristic leaves on the fertile stem, as well as the morphology of the umbel, it approaches near to *A. piauihyensis* and also to *A. foliosa* Mart.

24. *A. REGNELLIANA* F. Kraenzlin, Amaryllidaceae quaedam novae v. criticae. Beibl. Bot. Jahrb. 50 nr. 112: 2-3, 1913.

Description.—Stem stout glabrous; sterile stems densely foliated, 75 cm. long. Leaves turned upside down or resupinate, linear-lanceolate, acute to acuminate, glabrous 15 cm. long, 1.5 mm. wide. Fertile stems 120 cm. long, 1 cm. thick at the base. Inflorescence umbellate; bracts of the peduncles very small or wanting; peduncles usually 5—8 cm. long. Flowers horizontal, somewhat drooping, funnel-shaped, 3.5 cm. long. Sepals petal-like oblanceolate, acute, long-unguiculate at the base, more or less flesh colored, thereupon greenish. Petals with dark red spots. Stamens short. Capsule globose, above applanate, 1.5 cm. thick. Flowers in November.

Notes.—Brasil; State of Minas Geraes, Las Caldas. Leg. Regnall nr. III 4796. Kraenzlin remarks that this species shows relationship to three or four others without mentioning the names. Conspicuous is the arrangement of the leaves; they are not distinctly in a spiral, they remind one more of a "reitend" appearance, as in *Iris* and *Gladiolus*. There is an absence of bracts near the individual flowering stems. The flowers as well as their color remind one of those of *A. psittacina* Lehm., under which we understand *A. pulchella* L. f., though other characteristics could not be compared with this species.

25. *A. SCABERULA* Baker Journ. Bot. 1877, 261; Baker Amaryll. 137. 1888.

26. *A. LONGISTAMINEA* Mart., in Schult. f. Syst. VII, 739. Herbert Amaryll. 90; Baker Amaryll. 137. 1888.

27. *A. INODORA* Herb. Amaryll. 90, tab. 2, fig. 1; Baker Amaryll. 137. 1888.

Notes.—According to Herbert, Mr. Tweedie wrote that on the first shooting this plant has much the appearance of *A. caryophyllaea*, but as it advances, becomes very different; that its tubers are less palmate, and its flowers are scentless. *A. nemorosa* Gardn., Bot. Mag. pl. 3958 is included as a variety.

28. *A. INSIGNIS* Fr. Kraenzlin, Amaryllidaceae quaedam novae v. criticae. Beibl. Bot. Jahrb. 50 nr. 112: 3—4, 1913.

Description.—Rhizomes or root-tubers unknown. Fertile stem about 90 cm. high; leafless for three quarters from the base. Leaves close together, long petiolate. Petioles twisted, 2—4 cm long; blades oblong-lanceolate, acute, thin, 2.5—12 cm. long, 1.5—3.5 cm. wide. Bracts about 5, oblong, obtuse; pedicels 4.5 cm. long. Umbel about 6-flowered. Sepals

petal-like, linear toward the base, further dilate, spathulate to obovate; 1.2 cm. wide; petals more expanded, above rotundate, apiculate, about 4 cm. long, 1.6 cm. wide. Stamens 3 cm. long. Ovary inversely conical, 6—7 mm. long. Color of the flowers unknown.

Notes.—Brasil; São Paulo, Alto de Serra, between shrubs. Drusen nr. 14218. According to Kraenzlin it is difficult to decide whether this species is related to *A. caryophyllaea* Herb. (Jacq.?), *A. inodora* Herb., or similar species.

29. *A. PYGMAEA* Herb. Amaryll. 100, 397. tab. 8, fig. 4-13; Baker Amaryll. 137. 1888.

30. *A. REVOLUTA* Ruiz et Pav. Flor. Peruv. III, 59; Herbert Amaryll. 91; Baker Amaryll. 137. 1888.

31. *A. VERSICOLOR* Ruiz et Pav. Flor. Pav. III, 59; Baker Amaryll. 138. 1888.

Notes.—Baker recognized var. *recumbens* (Herb.), in Baker Amaryll. 97 and var. *Cumingiana* (Herb.), in Baker Amaryll. 11. 96. They were described by Herbert as separate species. Baker mentions that from the material at hand, he cannot separate specifically *A. tenuifolia* Herb., *A. nivalis* Meyen, *A. Kingii* Phil., *A. xanthina* Phil., *A. puberula* Phil., *A. tigrina* Phil., and *A. citrina* Phil. Also in the Index Kewensis these are referred to *A. versicolor*.

32. *A. FIEBRIGIANA* F. Kraenzlin, Amaryllidaceae andinae in Ign. Urban, Plantae novae andinae imprimis Weberbauerianae III. Bot. Jahrb. 40: 237, 1908.

Description.—Roots fibrous, fleshy. Rhizome more or less prostrate. Stem 20—30 cm. long. Leaves lanceolate, acuminate, glabrous, 6 cm. long, 6—8 mm. wide. Inflorescence 2-flowered; bracts leaf-like as long as the pedicels. Pedicels usually four, 3—4 cm. long. Bracteoles short. Flowers yellow, striped with pink, 3 cm. wide; sepals unguiculate, lanceolate, acute apex recurved, 2.3—2.5 cm. long, 6—7 mm. wide; petals obovate, obtuse, minutely apiculate, 2—2.2 cm. long, 1 cm. wide. Stamens as long as $\frac{3}{4}$ of the perigone, equal; filaments pilose. Style a third or a quarter shorter. Ovary glabrous.

Notes.—Southern Bolivia; Escayache near Tariija; along rocky slopes at an elevation of 3700 meter above sea-level. Fiebrig nr. 3013. This species resembles *A. recumbens* Herb. [*A. versicolor* Ruiz et Pav., var. *recumbens* (Herb.) Baker.]. Its habit is however, shorter and more compact, bearing a large number of lanceolate leaves. The rhizome is almost leafless. The inflorescence is always 2-flowered.

33. *A. INCONSPICUA* Phil. Anales Univ. Chili. 1873, 546; Baker Amaryll. 138. 1888.

34. *A. NIVALIS* Phil. Linnaea 29: 58, 69, 1857, non Meyen. Baker Amaryll. 138. 1888.

35. *A. PAUPERCULA* Phil. Flor. Atac. 51, nr. 371; Baker Amaryll. 138. 1888.

Notes.—This species is related to *A. violacea* Phil. It was first found in Atacama, Mejillones at 400 meter elevation, on a desert coast mountain.

36. *A. ROSEA* Phil. Sert. Mendoc. Alt. 43, non Hook.; Baker Amaryll. 139. 1888.

37. *A. ARAUCANA* Phil. Anales Univ. Chil. 547, 1873; Baker Amaryll. 139. 1888.

38. *A. VOLCKMANNII* Baker Amaryll. 139. 1888; *A. stenopetala* Phil. Anales Univ. Chil. 71, 1871, non Schenck.

39. *A. VIOLOCEA* Phil. Flor. Atac. 51. nr. 370; Baker Amaryll. 139. 1888.

Notes.—Philippi states that this species is very variable, like many other species of this genus. It is therefore difficult to classify a specimen from the description. Plants occur with one flower; other inflorescences have three, five and more flowers.

40. *A. LIGTU* L. Spec. Plant. ed. 2. 462; Feuillée Obs. II. 710. t. 4; Herbert Amaryll. 92; Lindl. Bot. Reg. 1839. t. 3; Baker Amaryll. 139. 1888, non Curt. Bot. Mag. t. 125.

Notes.—This species was described and illustrated by Feuillée in 1714, being the first illustration of an *Alstroemeria*. He found the plant growing near Concepcion, Chile. Baker mentions the var. *pulchra* Sims in Bot. Mag. t. 2421. (*A. bicolor* Hook. Exot. Flora t. 65; Lodd. Bot. Cab. t. 1147, *A. Flos-Martini* Ker. Bot. Reg. t. 731; Sweet Brit. Flow. Gard. ser. 2. t. 277, *A. tricolor* Lodd. Bot. Cab. t. 1497.) Its leaves are narrower than those of the species.

41. *A. PARVULA* Phil. Linnaea 261, 1864-65; Baker Amaryll. 139. 1888.

42. *A. NUBIGENA* Phil. Linnaea 67, 1857-58; Baker Amaryll. 140. 1888.

43. *A. PHILIPPII* Baker. Amaryll. 140; *A. violacea* Phil. Descr. Nuev. Pl. 72, 1873; non Flor. Atac. nr. 370.

44. *A. PELEGRINA* L. Spec. Plant. ed. 2. 461; Feuillée Obs. II, t. 5; Bot. Mag. t. 139; Jacq. Hort. Vind. I. t. 50: III. t. 73; Lil. t. 46; Lodd. Bot. Cab. t. 1205; Baker Amaryll. 140. 1888.

Notes.—The plant was introduced in 1753. It is called *P. peregrina* by Herbert. He mentions three varieties e. g. *albescens*, *squamata* and *flore pleno*. Of the last he states that it is a beautiful white with green variety.

45. *A. GAYANA* Phil. Linnaea 71, 1857-58; Baker Amaryll. 11, 140. 1888.

Notes.—This species is considered by some as intermediate between *A. pelegrina* and *A. haemantha*.

46. *A. HAEMANTHA* Ruiz et Pav. Flor. Peruv. III, 60; Herbert Amaryll. 99; Sweet. Brit. Flow. Gard. ser. II. t. 158; Regel, Gartenflora t. 264; Baker Amaryll. 140-141. 1888; *A. pulchella* Sims in Bot. Mag. t. 2354; Hook. Exot. Flora t. 64; Lindl. in Bot. Reg. t. 1008; *A. simsii* Spreng.; Sweet in Brit. Flow. Gard. t. 267.

Notes.—Herbert states that this is a variable species. He recognizes the following varieties *simsiana*, *albida* and *pilosa*.

47. *A. AURANTIACA* D. Don. in Sweet Brit. Flow. Gard. ser. 2. t. 205; Lindl. in Bot. Reg. t. 1843; Baker Amaryll. 141. 1888; *A. aurea* Meyen; Hook in Bot. Mag. t. 3350.

Notes.—Herbert in his Amaryllidaceae, p. 98, described this species under the name of *A. aurea*. He states that it was collected on the Island of Chiloe and was grown from seed by Mr. Lowe, nurseryman at Clapham. At that time it was considered a very beautiful plant, being very hardy.

48. *A. BAKERI* Ferd. Pax, Beitrage zur Kenntnis der Amaryll. idaceae, Bot. Jahrb. 11: 335, 1890.

Description.—Stem erect, slender, 30—40 cm. high, 3—4 mm. thick. Leaves linear, acute not resupinate, sessile, glabrous, 2—4 cm. long, 5—6 mm. wide. Inflorescence pseudo-umbellate, 2-flowered, elongate. Bracts leaf-like, 1—1.5 cm. long, 2—5 mm. wide. Pedicels 3—4 cm. long. Flowers entire; sepals 1.5 cm. long, 5—6 mm. wide; petals 2 cm. long; 6 mm. wide, subequal, oblong-lanceolate, acute, unguiculate. Stamens very much declinate, shorter than the perigone; filaments filiform 1.5 cm. long; anthers globose. Style declinate, filiform, shorter than the stamens, 1 cm. long; stigma 3-cleft; ovary turbinate, 5 mm. long.

Notes.—Argentina; Catamarca. Leg. Schickendantz XII, 79. This species shows affinity to *A. aurantiaca* D. Don, from which it distinguishes itself through its small, sessile, linear leaves which are not resupinate; the loose flower cluster and the smaller flowers.

49. *A. VENUSTULA* Phil. Linnaea 260, 1864-65; Baker Amaryll. 141. 1888.

50. *A. LINEATIFLORA* Ruiz et Pav. Flor. Peruv. III, 60. t. 289; Herbert Amaryll. 92; Baker Amaryll. 141. 1888.

51. *A. PAVONIANA* G. Beauverd, Phanerogamarum Novitates, Bull. Soc. Bot. Geneva. 2 ser. 14: 176-177, 1 fig. 1922.

Description.—Fertile stem 10 mm. thick, glabrous, very leafy. Leaves linear-lanceolate, 1.5 cm. long, 15 mm. wide, revolute, base semi-amplexicaule, apex acute. Umbel nodding, 12 to 15 flowered; pedicels short. Perigone 6.5 cm. long; sepals linear, spatulate, 6 cm. long, 8 mm. wide; apex obtuse; petals spatulate-lanceolate, 6.5 cm. long, 10 mm. wide; apex subacute. Stamens 6 cm. long; anthers intrors; Ovary

conical, attenuate; style 30—35 mm. long; stigma filiform, 8 mm. long. Capsule unknown.

Notes.—Peruvian Andes. Leg. Pavon. Type in Herbarium Boissier. The description of this species is based upon incomplete material. Yet this species is entirely different from those that have been described from the Andes. It may have some affinity to *A. lineatiflora* Ruiz et Pav. It is distinguished by an inflorescence with much shorter rays and which are much more numerous. The specimen of Pavon was found among the material of *Bomarea*. It resembles somewhat *B. glaucescens* (H.B.K.) Baker, but as a result of the examination of the perigone, there is no doubt but that this is a typical andine *Alstroemeria*.

52. *A. CHORILLENSENSIS* Herb. Bot. Reg. 1843; Misc. nr. 95; Baker Amaryll. 141. 1888; *A. lineatiflora* Lindl. Lindl. in Bot. Reg. 1843, t. 58, non Ruiz et Pav.

Notes.—The type specimen of this species was a cultivated plant. It was originally sent from Lima by Maclean.

53. *A. CROCEA* Phil. Linnaea 264, 1864-65; Baker Amaryll. 142. 1888.

This species is related to *A. spathulata* Presl.

54. *A. SPATHULATA* Presl. Rel. Haenk. II, 122. t. 22, fig. 2; Herbert Amaryll. 94; Baker Amaryll. 142. 1888.

Notes.—*A. sericantha* Schuer (*A. umbellata* Meyer) is likely a dwarf variety of *A. spathulata*. The one described as *A. neillii* Hook. in Bot. Mag. t. 31-5 may be a robust cultivated specimen. There is possibility that *A. andina* Phil., in Linnaea 29, 1857-58, with smaller flowers belongs here.

55. *A. CRISPATA* Phil. Linnaea 70, 1857-58; Baker Amaryll. 142. Baker describes it as a "very distinct and curious little species."

56. *A. SOTOANA* R. A. Philippi, Plantas nuevas chilensis, Anales Univ. Chile 93-159, 1896.

Description.—Rhizome and root-tubers unknown. Of five specimens examined the tallest was 47 cm. with nine flowers; the shortest being 10.9 cm. high with only two flowers. Leaves resupinate, more or less close to each other; smaller ones reduced to scales; the largest 25 mm. long and 3.5 mm. wide, linear, acute, crassicaule. Umbel bifid, 2 to 9-flowered, carrying at its base of the peduncles bracts of equal size, 20 mm long. Flowers yellowish, purple spotted. Segments of the perigone 32 mm. long, 11 mm. wide, narrow, rounded at the top, mucronate. Stamens and the style bent downward, then raised along the length of the perigone.

Notes.—No relationship to other species is indicated. Chile; Andine Valey "de los Cipreses."

57. *A. PATAGONICA* R. A. Philippi, Plantas nuevas chilensis, Anales Univ. Chile. 93: 160, 1896.

Description.—Rhizomes and root-tubers unknown. Stems low, about 8.5 cm. high. Leaves close together, linear, turned upward or resupinate,

narrow toward the base, 22 mm. long, 2 mm. wide; the lowest scale-like. Stalk one-flowered. Segments of the perigone of the same length; sepals 20 mm. long, 8 mm. wide, spatulate, mucronate; yellow inside, pink outside, all the way to the middle purple spotted; 20 mm. long, 5 mm. wide. Style shorter than the perigone, about 16 mm. long; stigma 2 mm., revolute, elongate, broad.

Notes.—Chile; from Santa Cruz. Collector Henricus Ibas, 1877. No relationship to other species has been indicated.

58. *A. NANA* A. B. Rendle, in Mr. Hesketh Prichards Patagonian Plants, Journ. Bot. 42: 325-326, 1904.

Description.—Low glabrous herb. Fertile stems 8—12 cm. high, 2 mm. thick, colorless below, tinged with red, occasionally greenish above. Sterile stems reaching about half the length and thickness of the fertile stems; its leaves 2.5 cm. long, 1.5—2 mm. wide. Leaves of the fertile stem scale-like, 6—8 mm. long to slender linear, 1.5—2 cm. long. Flowers, single, erect, terminate. Perigone 2 cm. long; sepals 7 mm. wide, spatulate, cuspidate, yellowish; petals slightly narrow and longer, reddish spotted. Filaments slender, complanate, more or less recurvate, shorter than the perigone; anthers short, sub-uniform, 1 mm. wide. Style shorter than the perigone; stigma linear.

Notes.—Patagonia; a flowering specimen was collected on the slopes of Mt. Frias and shingle beach of Lake Argentina, and a leafy specimen on the top of Mt. Frias.

This species is apparently related to *A. patagonica* Phil. Baker states that the plants are about the same size as those of the andine species *A. pygmaea* Herb., which is also a one-flowered species. The specimens described by Rendle were part of the plants collected in Patagonia by Mr. Hesketh Prichards. They were presented by him to the National Herbarium. They came from "the western end of Lake Argentine, where the lake is broken into many fiords by the forest-clad foot-hills of the Andes." Lake Argentine is situated at about 650 feet above sea-level.

59. *A. POLYPHYLLA* R. A. Philippi, Plantas nuevas chilensis, Anales Univ. Chile. 93: 160. 1898.

Description.—Rhizomes and root-tubers unknown. Plants low, stem about 12 cm. high, densely covered with leaves. Leaves resupinate, oblong, acute, narrow toward the base, 35 mm. long, 14 mm. wide. Inflorescence umbellate, number of flowers variable; bracts short linear-lanceolate, 12 mm. long. Perigone 17 mm. long, yellow to light yellow, unequal, narrow lanceolate; petals purple spotted above. Stamens as long as the perigone; style slightly longer.

Notes.—Chile; in the desert of Atacama, Quebrada de Sorna, collected by Franciscus San Roman. No relationship to other species has been indicated.

60. *A. MODESTA* R. A. Philippi, Plantas nuevas chilensis, Anales Univ. Chile. 93: 161. 1896.

Description.—Rhizome and root-tubers unknown. Stem as far as its bifurcation 14 cm. long, 4 mm. thick. Scale-like leaves 8 mm. long, 4 mm. wide, those toward the base of the flowers 14 mm. long. Umbel 2-flowered, with two bracts. Peduncles about 4 mm. long; bracts 10 mm. long. Flowers white to whitish; sepals toward the top more or less violet, obovate, tridentate, 26 mm. long, 12 mm. wide; petals to 30 mm. long, 11 mm. wide, yellowish with purple spots.

Notes.—Chile; reported from Copiapo. No relation to other species has been indicated.

A. GRAMINEA R. A. Philippi, Plantas nuevas chilensis, Anales Univ. Chile. 93: 161-162. 1896.

Description.—Rhizomes and root-tubers unknown. Stem about 7 cm. long, glabrous, covered densely with leaves. Leaves narrow linear, 3.8 to 6 cm. long, 3 mm. wide, straight, sharp pointed. Stem one-flowered. Flowers sub-sessile, small. Segments of the perigone obovate or obovate, pale red, ending in a short pointed tip, lemon color spotted, 17 mm. long, 5 mm. wide, oblong, becoming very narrow; Stamens much shorter than the perigone.

Notes.—Chile; from Breas in the desert of Atacama. Collected by Alamirano Larrañaga. No relationship to other *Alstroemerias* is indicated.

62. A. AMAZONICA A. Ducke, Plantas nouvelles ou peu connues de la region amazonienne, Archiv. Jardin do Rio de Janeiro, 1: 12, plate 3. 1915.

Description.—Rhizome and root-tubers unknown. Fertile stem 40 cm. high. Leaves usually strongly reduced, sessile, glabrous, spatulate; the upper ones lanceolate, 1—1.5 cm. long, 4 mm. wide. Sterile stems often flexuous; its leaves petiolate, ovate-lanceolate, pointed at the apex. Bracts of the involucre four, ovate-lanceolate, 2.5 cm. long, 6 mm. wide. Umbel simple, 2—6.5 cm. long, erect to spreading, angulose. Perigone nodding, tubulate-campanulate, 4.5 cm. long, 2.5 cm. wide; sepals subequal, 8 mm. wide; petals 6 mm. wide, ovate-lanceolate, base anguiculate, apex acute, red, partly greenish-yellow. Stamens shorter than the perigone; filaments subulate; style as long as the stamens.

Notes.—Brazil; the first *Alstroemeria* that was found in Amazonia, in the northwestern part of the state of Pará. The very reduced leaves that are found along the flowering stem are very characteristic of this species. No relationship to other species has been indicated.

ACKNOWLEDGMENTS.—The writer wishes to acknowledge the kindness and help extended, during the preparation of the manuscript, by Dr. F. C. Hoehne, Director of the Institute de Botanica, São Paulo, Brazil; Mr. Ralph W. Wheeler of Winter Park, Florida; Prof. Erdman West of the Florida Agricultural Experiment Station, Gainesville, Florida; the Library Staff of the U. S. Department of Agriculture, Washington, D. C., and the New York Botanical Garden.



Amaryllis maracasa Traub, sp. nov.

Plate 5

AMARYLLIS MARACASA, SP. NOV.

HAMILTON P. TRAUB, *Maryland*

On one of his plant exploration trips, Mr. Mulford B. Foster, of Orlando, Florida, collected an odd and interesting species which was new to science and which has been named *Amaryllis maracasa*. It appears to be closely related to *Amaryllis organensis*, differing markedly in having greater diversity in tepalseg sizes and shapes, and in having a flower which does not open widely (Plate 5). It is an interesting addition to the collection of species, and will be treasured on that account. However, for the experienced breeder, it could add something worth while to the synthesis of hybrid *Amaryllis* since it flowers 2 to 3 times from the same bulb over about a two months' period.

Amaryllis maracasa Traub, sp. nov.

Herba bulbosa; foliis usque ad 7 lanceolatis acutis, ad basin 2.2 cm. latis, medio 3.9 cm. latis; pedunculo 64—71 cm. alto; umbella biflora; spatha bivalvata, valvis 5.5—6.5 cm. longis; pedicellis 5.5—8 cm. longis; perigonio 14 cm. longo non patulo lateritio-rubro, gula asteri viridi ornata; segmentis tepalorum aliquanto irregularibus, magnitudine in ordinibus 4; tubo tepalorum 2 × 1 cm.; paraperigonio 1—2 mm. longo, setis albidis; staminibus segmentis maximis tepalorum brevioribus exsertis; stigmatibus trifido, lobis globulosis.

Bulb medium sized; leaves up to 7, glaucous, with whitish bloom, up to 52 cm. long, concave on upper side, edges recurved downward, lanceolate, acute, 2.2 cm. wide at the base, 3.9 cm. wide above the middle, narrowing to an acute apex; peduncle reddish toward the base, dull green otherwise, with a distinct whitish bloom, up to 64 cm. tall at anthesis, elongating up to 71 cm. after anthesis, up to 1.5 x 2 cm. at the base, nearly round at the middle, up to 1.8 x 1.8 cm. in diam. and 1 x 1.1 cm. at the apex; umbel 2-flowered; spathe 2-valved, valves 5.5—6.5 cm. long, lanceolate, acute; pedicels 5.5 cm. long at anthesis, elongating 7—8 cm. after anthesis; perigone 14 cm. long, not wide open, 11 cm. across face, brick red (RHS o16/1), reticulated deeper red, green star in throat; ovary 1.6 cm. long, 9—10 mm. wide, triangular-rounded, slightly curved; tepaltube about 2 cm. long, 1 cm. wide; a small paraperigone of whitish bristles above the stamens; tepalsegs of four different sizes: top setepalseg much widened (6 cm.) at the middle, 12 cm. long, apex acute; the two bottom setepalsegs similar but narrower at the middle, conniving-sickle-shaped, 11 cm. long, up to 4.8 cm. wide, apex acute; the upper two petepalsegs lanceolate, acute, 11 cm. long, 3.2 cm. wide, apex acute to acute-rounded; the bottom petepalseg lanceolate, acute, 9.8 cm. long, 2.2 cm. wide at the middle; stamens and style entirely close in the throat of tepaltube; stamens of four different lengths, shorter than the longer

tepalsegs, style reddish, exserted, about as long as the top setepalseg; stigma white, trifid, lobes globulose. Type: Traub nos. 198, 199, 200 and 201, in the Traub Herbarium; type illustration, Plate 5.

RANGE.—Brasil; at Monte de Burro, municipio Maracas, State of Bahia, alt. 3,500 ft.

NOTES.—Flowered under cultivation in June and July, 1951.

FURTHER REMARKS ON AUSTRALIAN AMARYLLIDS

C. M. EARDLEY, *The Herbarium, University of Adelaide*

Taking as a basis the recent article of Mr. J. H. Willis (PLANT LIFE, Vol. 5 No. 4, Oct. 1949, pp. 51-53.) on Australian Amaryllids, we have the following state of affairs. Most of the published Australian floras in common use are not of very recent date, except odd regional ones; and amaryllidaceous plants are not particularly numerous in the Australian native flora (there is, however, a rather notable group of endemic genera in south-western Australia); therefore most taxonomists concerned with the Australian flora think of the family in its widest sense as did the older authors like Bentham and even Pax and Hoffman in their monograph in the second edition of Engler and Prantl's *NATUERLICHE PFLANZENFAMILIEN*, 1930. There has been no influential expression of critical opinion by Australian botanists on the subject of Hutchinson's revised classification of 1934, in so far as it affects the Australian genera.

However, this matter of the limits of the family has of necessity been carefully considered for the policy of the journal *HERBERTIA*, consequently the only Australian genera one can legitimately discuss here are the three—*Crinum*, *Eurycles* and *Calostemma*, all bulbous plants with basal leaves and umbellate inflorescences.

Nevertheless, it is not out of place to mention that amaryllid enthusiasts are missing some most interesting and peculiar forms when they cast out of the fold of *Amaryllidaceae* proper that group of genera endemic to south-western Australia included in the tribe *Conostyleae*; Mr. Willis names these five genera in his previously mentioned article under Nos. 8, 9, 10, 11 and 12. Some of them, like the Kangaroo Paws (*Anigozanthos*), are known as horticultural rarities in Europe and America; others are not cultivated as yet; in this tribe the floral perianth is of stout woolly texture rather like a piece of rough velvet fabric, with the rough outside and the smooth inside; the flowers therefore look unreal, particularly in the species with unusual colour combinations such as hard red with green, black with yellow, or bright green alone; some of the yellow and orange forms are more delicate in colour.

There is also that other successfully cultivated Australian endemic

genus, *Doryanthes*, which has the *Agave* growth habit and produces a huge and ornamental spikelike inflorescence of red flowers. However, neither *Doryanthes* nor the *Conostyleae*, tempting and fascinating though they be, are for the followers of the pure cult of the amaryllid. Nor has Australia any *Agapantheae*, *Gilliesieae* or *Allieae*, as accepted by Hutchinson for the family.

Let us then turn our attention to what is acceptable from the Australian native flora.

First of all there is *Calostemma* (restricted to Australia) with four species found in the eastern mainland states, they are —

C. purpureum R. Br. Flowers red or pink; the southern-most species.

C. luteum Sims. Flowers yellow; in cultivation.

C. Scott-Sellickianum F. M. Bailey.

C. album R. Br. Flowers white. (Has affinities to *Eurycles*)

The first, *C. purpureum* has a southern distribution, and the other three species occur in warmer regions, especially Queensland. The flowers are smaller than those of most species of *Crinum* and *Eurycles* but are produced in umbels like them, and they have a small corona. There is one fleshy seed per flower which germinates in a curious way and somewhat resembles the seeds of certain *Crinums*, *Eurycles* and *Coburgia*. The cultivation in California of *C. purpureum* was recorded in HERBERTIA 9: 1942 p. 99. On account of the small flowers *Calostemma* would probably be best grown in rows or masses.

Illustrations.—Bot. Mag. t. 2100, t. 2101, Botanical Register 421, 422: 1840 t. 26; 1840 t. 19; F. M. Bailey—"Comprehensive Catalogue of Queensland Plants," Brisbane. 1909, and Bailey—"Queensland Flora" V. Brisbane, 1902.

The next genus *Eurycles* has two species —

E. Cunninghamii Ait. is endemic.

E. sylvestris Salisb. is shared with the Malayan Archipelago and is known by various synonyms, among them *Pancratium amboinense* L. They occur in Queensland and New South Wales and are both white flowered. There is a corona and the flowers are of medium size; they are probably rare in horticulture.

Illustrations.—Bot. Mag. t. 3399, t. 1419; Botanical Register 715; 1506.

Our final genus *Crinum* needs no introduction to horticulturists; there are now approximately 130 species recognized with over 30 in culture. The horticultural possibilities of any *Crinum* are worth investigating, therefore the 12 Australian species will be listed. Northern Australia, particularly Queensland, has the majority of these species, the one that extends farthest into the temperate part of Australia is *C. flaccidum* which occurs as far south as Victoria and South Australia; it is popularly called the "Murray Lily" because it is found along the River Murray as well as in other dry inland regions.

In giving this list it should be stated that no attempt has been

made to include varieties or to quote the many synonyms; the names listed are all to be found in the REVIEW OF THE SPECIES OF *Crinum* by J. C. Th. Uphof (HERBERTIA 9: 63-84, 1942) where references to descriptions are given, and if these are not readily available, they are quoted by Uphof; thus he gives the descriptions of the five species named by the Queensland botanist, F. M. Bailey (possibly all endemic). All of Bailey's species except his later *C. intermedium*, are described and illustrated in his QUEENSLAND FLORA Vol. V, Brisbane, 1902, where collecting localities are also given; this work gives descriptions of the other Australian species also, except *C. asiaticum* which is not confined to Australia.

The seeds of *Crinum* are often fleshy and large like a small potato. Various hybrids have been produced; flower colour in the genus is white or reddish. Some references to illustrations are given here, more will be found in G. Bentham's FLORA AUSTRALIENSIS Vol. VI and in Uphof's "Review"; the numbers in front of the species below refer to the list in the last mentioned work. It will be interesting to find from readers of HERBERTIA how many of these species have been tried in cultivation.

Crinum species native to Australia

[See F. M. Bailey's QUEENSLAND FLORA V, Brisbane, 1902]

76. *C. flaccidum* Herbert, Murray Lily. Probably endemic. Ill. Bot. Mag. Pl. 2133; Bot. Register 426.

1. *C. asiaticum* L. Not described in "Queensland Flora," but well known from tropical Asia. Ill. Bot. Mag. Pl. 1073.

47. *C. venosum* R. Br. Ill. "Comprehensive Cat. Quld. Pl." Probably endemic.

48. *C. uniflorum* F. v. M. Ill. "Comprehensive Cat. Quld. Pl." Probably endemic.

4. *C. brachyandrum* Herbert. Probably endemic. Ill. Bot. Mag. 2121.

49. *C. angustifolium* R. Br. (2 vars.) Probably endemic. Ill. Bot. Mag. 2522.

13. *C. pedunculatum* R. Br. According to Bailey has several perennial stems up to 2 feet high, bearing leaves and flower stalks; in other species these latter arise from the bulb. Probably endemic. Ill. "Quld. Flora"; Bot. Reg. Pl. 52; Bot. Mag. Pl. 2121 (as *C. canaliculatum* Roxb.)

45. *C. intermedium* Bail. Described in Queensland Agric. Journ. N. S. 1: 124, 1919. From Wai Weir Island.

3. *C. Douglasii* Bail. Ill. "Quld. Flora." Thursday Island.

46. *C. brevistylum* Bail. Ill. "Quld. Flora." Turtle Island.

51. *C. pestilentis* Bail. Ill. "Quld. Flora." Bulloo River. Odour so strong as to cause some people to vomit.

50. *C. brisbanicum* Bail. Ill. "Quld. Flora." Near Brisbane.

NARCISSUS POETICUS IN THE AUSTRIAN ALPS

The illustration, Figure 6, showing a field of blooming *Narcissus poeticus* in the Austrian Alps was furnished by Eugen Hahn, Allee-
strasse 4, Kirchheimbolanden, Pfalz., Germany.



Fig. 6. Field of *Narcissus poeticus* in the Austrian Alps. Photo by Eugen Hahn.

ON THE SYSTEMATIC POSITION OF *LAPIEDRA MARTINEZII* LAG.

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INTRODUCTION

In discussing the problem of the systematic position of the genus *Lapiedra* Lag., Traub and Moldenke (1947) write: "The systematic position of *Lapiedra* now appears to be secure among the *Galantheae*, but it must be realized that all the needed evidence has not yet been assembled. It is particularly important to determine the chromosome complement before considering the case closed." At the same time, these authors have had the kindness to encourage us to make this study.

Having succeeded in obtaining some bulbs of *Lapiedra Martinezii* Lag., we have undertaken to study the cytology of this species with the aim of filling in the lacuna pointed out by Traub and Moldenke (1947). We are reporting here the results of our researches, which have been limited to a study of the chromosomes in the cells of the root tip meristems and in the pollen grains, since, unfortunately, because of lack of material, we have not succeeded in studying meiosis.

MATERIAL AND TECHNIQUE

Lapiedra Martinezii Lag. is a difficult plant to obtain, since it is found only in the east and south of Spain and in the north of Spanish Morocco. However, thanks to the kindness of Professor Munoz Medina, Catedratico de l'Universite de Granada, and of M. P. Palau Ferrer, (we express here our strongest thanks to them for the aid granted us), we obtained some bulbs; these have been grown in pots at the Botanic Garden in Coimbra. These bulbs have furnished many root tips which have been fixed in Navashin's fluid and La Cour 2BD. After paraffin infiltration, the root tips have been cut in transverse sections at 20 μ thickness, and afterward stained in gentian violet.

During the summer of 1949, we tried to obtain reduction divisions in the pollen mother cells. Unfortunately, all of the attempts made for this purpose have failed and we were only successful in finding flowers with anthers that already had pollen grains. These anthers, sampled from two different plants, were fixed in alcohol-acetic (3 parts absolute alcohol: 1 part crystalizable acetic acid). Afterwards, non-permanent preparations have been made from these anthers, by means of dissociating them in either a drop of aceto-carmin, or acetic-orcein,

OBSERVATIONS

In metaphase plates of the root tip cells, we have counted 22 chromosomes, corresponding to 11 pairs with the following morphological characters (fig. 7) :

A—Isobrachial pair LL, where no secondary constriction has been observed;

B—Pair Ll, each arm shows a secondary constriction, localized a short distance from the centromere;

C—Pair Ll, having no secondary constrictions and with the arm l less long than that of the preceding pair;

D—Pair Lp', having the arms longer than all other pairs of Lp;

E—Pair Lp', similar to the above pair but with the arm p shorter;

F—Pair Lp, rather similar to pair E, but minus the satellite, and the arm p less long;

G—Pair ll, very close to isobrachial;

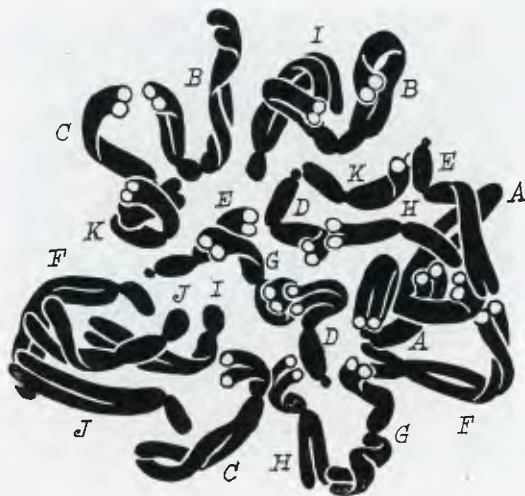


Fig. 7. *Lapiedra martinezii* Lag. Equatorial plate of a root tip cell showing 22 chromosomes. The 11 pairs are indicated by the letters A-K x 3450.

H—Pair lm;

I—Pair lp;

J—Pair lp, rather like the pair I, but the arm p less long and the arm l a little shorter.

K—heterobrachial mp;

Because of their small size, it is very difficult to obtain evidence of all four satellites in the same figure. However, we have succeeded in some cases (fig. 7). According to the number and position of the satel-

lites, we have verified the appearance at the first stage of telophase, of four nucleoli occupying a proximal position.

Among the root tips examined we have found one that shows mixoploidy, with some cells diploid and other tetraploid, having 44 chromosomes (fig. 8). The latter cells have been found in the periblem, where they form longitudinal rows among the normal cells. Very probably, tetraploid cells have been produced by means of a mechanism that we have described for *Narcissus reflexus* Brot. (v. Fernandes, 1936); that is to say by the fusion of two nuclei after mitosis, that has not been followed by cytokinesis or followed by the formation of an incomplete wall.



Fig. 8. *Lapiedra martinezii* Lag. Tetraploid equatorial plate (44 chromosomes) in the periblem of a mixoploid root. x 3450.

In the equatorial plates of the first division of the nucleus of the pollen grains (fig. 9), we have counted 11 chromosomes that show besides a high degree of correspondence to the characters of the pairs that have been described in connection with the root tips. Thus, the idiogram of *Lapiedra Martinezii* Lag. can be represented by the following formula (fig. 10a and b).

GEOGRAPHIC DISTRIBUTION

Lapiedra Martinezii Lag., only grows in the fissures of calcareous rocks (Willkomm and Lange, 1861-1880) in the mountains of eastern and southern Spain, and in the north of Spanish Morocco, as they show

in their list of localities,¹ as well as the map of fig. 11, constructed according to the data of a list given below:

Valencia: Sagunto; Mt. Murviedro.

Murcia: Santuario de Fuensanta near Algezares; neighborhood of Múrcia.

Granada: neighborhood of Códbar; Cabo de Gata; Almeria; Sierra de Elvira; Adra; Málaga; Churriana; Carratraca; Alpujarras; Lánjaron.

Cordoba: Rute.

Spanish Morocco: Villa Sanjuro, Melilla; Hassi-Berkan; etc. (Font-Quer).



Fig. 9. *Lapiedra martinezii* Lag. Metaphase plate of the first mitosis of a pollen grain. The 11 chromosomes are indicated by the letters A-K. x 1800.

DISCUSSION

According to Boissier (1839-1845) and Colmeiro (1858), Maria Josefa *Lapiedra* became by marriage Mrs. *Martinez*, being a lady from Sanlucar de Barrameda, she received from Simon de Bojas Clemente remarkable instruction in botany. She translated to French the "Memoire on the culture of tobacco" by Sarracin, and she dedicated this translation to the celebrated botanist, Lagasca. In turn, Lagasca (1816) dedicated the genus *Lapiedra*, founded on the species *L. Martinezii*, in such a manner that the name of the genus corresponds to her family name and the specific name to the married name of this lady. Accordingly, the supposition of Herbert (1837), in which he says that generic name has been

¹This list has been elaborated following the data from the work of Boissier (1839-1845), Willkomm and Lange (1861-1880), Colmeiro (1889), and Jahandiez and Maire (1931).

derived from a combination of the latin word *Lapis* and the Spanish word *piedra*, both meaning *stone*, is not tenable. Traub and Moldenke (1948) have suggested that possibly the name was invented by Lagasca from a combination of the Spanish words *la* and *piedra*, from the fact that the plants grow in rocky soil. Although, in reality, the name is composed of these two Spanish words it was not invented by Lagasca,

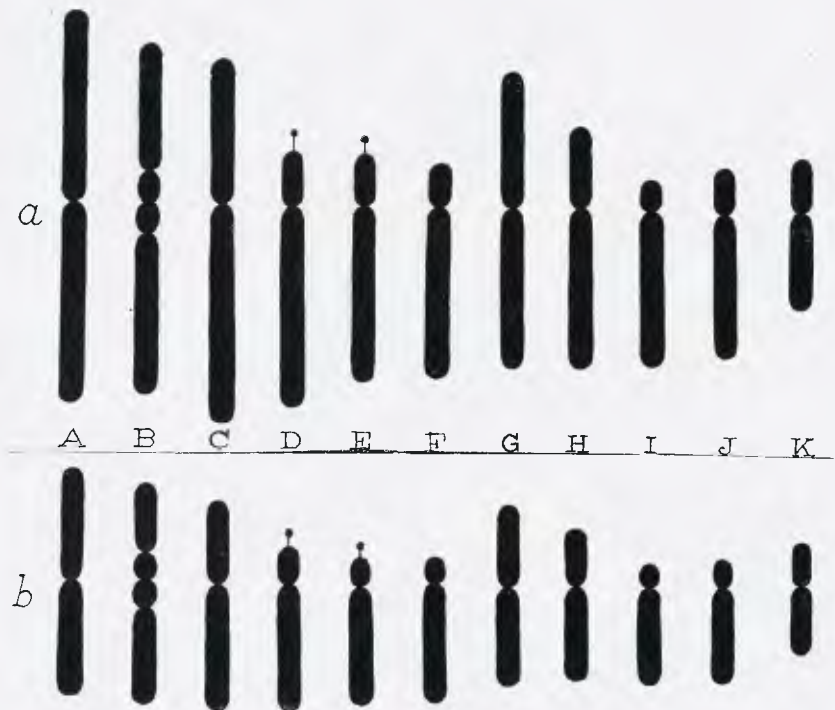


Fig. 10. Scheme representing the haploid idiogram of *Lapidra Martinezii* Lag. *a*. Idiogram constructed from the chromosomes of a root tip plate. *b*. *Idem* from chromosomes of the first mitosis of the pollen. Notice the correspondence of the chromosomal types. $2n = 22 = 2:LL + 2:Ll + 2:Ll + 4:Lp' + 2:Lp + 2:ll + 2:lm + 4:lp + 2:mp$.

since, as we have pointed out, it corresponds to the family name of the Spanish lady. However, the choice of this name has been a happy one, for the name, apart from rendering homage to a distinguished lady, recalls nicely the ecology of the plant.

As Traub and Moldenke have noted, the opinion of most authors concerning the systematic position of the genus *Lapidra* varied a great deal until 1888, the date when Pax placed it in his sub-tribe *Galanthinae*, comprising the genera *Galanthus* L., *Lapidra* Lag. and *Leucojum* L.

In their recent study, Traub and Moldenke (1947) have elevated

the sub-tribe to the category of a tribe, with the name *Galantheae*, which includes, besides *Lapiedra* Lag., the two other genera *Galanthus* L., and *Leucojum* L. However, the enumeration of these genera follows the order *Lapiedra*, *Leucojum*, and *Galanthus*, since the authors consider the first to represent the most primitive member of the group. The same authors



Figure 11. Geographic distribution of *Lapiedra Martinezii* Lag.

write that, at present, the systematic position of the genus *Lapiedra*, seems to be firmly established among the *Galantheae*, but they add that not all the evidence justifying this point of view has been assembled, since the chromosome complement of *Lapiedra Martinezii* Lag., was then unknown.

The cytology of the genus *Leucojum* L., has been studied especially by Heitz (1926), Satô (1918) and Neves (1939). According to the

studies of these authors, this genus has the basic numbers 7, 8, 9, and 11, and the complement is composed of rather long chromosomes, some of which are isobrachial, others heterobrachial, others cephalobrachial. In addition, one can state that species with a basic number of 7, possess a relatively higher number of isobrachial and heterobrachial chromosomes than do those species with a basic number of 9 or 11, when there is a preponderance of heterobrachial and cephalobrachial chromosomes.

Unfortunately, the cytology of the genus *Galanthus* is little known, since, of the 19 species enumerated by Traub and Moldenke, we know only the chromosomes of *G. nivalis* L. (Heitz, 1926, Transkowsky, 1930: Satô, 1937, 1938), *G. Cicilicus* Baker (Heitz, 1926) and *G. Elwesii* Hook, f. (Heitz, 1926; Satô, 1937, 1938), and *G. plicatus* (Satô, 1942). According to these studies, the basic number of this genus appears to be 12, and concerning the morphology of the chromosomes one can state that they clearly resemble those of species of the genus *Leucojum*.

A comparison of the idiogram of *Lapiedra Martinezii* with those of species of *Leucojum* and *Galanthus* shows that *Lapiedra* belongs to the same karyotype. Thus, the cytological data are in accord with the idea of considering the genus *Lapiedra* as belonging to the tribe *Galantheae* (Pax) Traub and Moldenke. From the fact that in *Lapiedra* the basic number is 11, the genus appears to be nearer *Leucojum* than *Galanthus*, and, in this connection, it has been noticed that the morphology of the chromosomes of *Lapiedra Martinezii* reveals a certain affinity with species of *Leucojum* having a basic number of 7, particularly with *L. autumnale*. This fact suggests perhaps, that the genera *Lapiedra* and *Leucojum* originated from a common ancestor. A study of our map of fig. 11, and map 5 of the work of Stern (1949) indicates that the data of geographic distribution of *Lapiedra Martinezii* and *Leucojum autumnale* are not opposed to this conception.

The genus *Lapiedra* has also been placed by Herbert (1837) adjacent to the genera *Gethyllis* L. and *Sternbergia* W. and Kit. Unfortunately, we have no knowledge of the cytology of the genus *Gethyllis*, but the chromosomes of *Sternbergia lutea* (L.) Ker-Gawl. have been studied by Yamamoto (1930), Nakajima (1936), Inariyama (1937), Satô (1938), La Cour (according to a citation from Darlington and Janaki-Ammal, 1945), Amico (1947), and in greater detail by Battaglia (1949), who presents, in his figure III, the idiogram of this species in a very precise fashion. Comparison of this figure with our fig. 10 shows that the idiograms of *Sternbergia lutea* (L.) Ker-Gawl. and *Lapiedra Martinezii* Lag. are different. Thus, the data from cytology are not in accord with the idea of considering the genus *Lapiedra* close to *Sternbergia* from the systematic point of view.

SUMMARY AND CONCLUSIONS

1. *Lapiedra Martinezii* a plant growing in the east and south of Spain and in the north of Spanish Morocco has 22 somatic chromosomes (11 gametic) and its idiogram can be expressed by the following formula:

$2n = 22 = 2:LL + 2:Ll + 2:Ll + 4:Lp' + 2:Lp + 2:ll + 2:lm + 4:lp + 2:mp$

2. A mixoploid root tip, having some longitudinal rows of tetraploid cells, has been found in a plant producing abnormal pollen. From the fact that this pollen has been produced as a consequence of the lack of the phragmoplast, the formation of tetraploid cells in the root tips has also been attributed to a total or partial lack of the phragmoplast in mitosis, followed by fusion of the daughter nuclei.

3. The cytological data are not in accord with the idea of considering the genus *Lapiedra* Lag. close to *Sternbergia* W. and Kit. from the point of view of systematics.

4. From the fact that *Lapiedra Martinezii* Lag. possesses a Karyotype similar to that of *Leucojum* L. and *Galanthus* L., the cytological data justify the idea of considering the genus *Lapiedra* as belonging to the tribe *Galantheae* (Pax) Traub and Moldenke, in accordance with the ideas of Pax (1887) and Traub and Moldenke (1947).

5. The cytological characters indicate a closer relationship between *Lapiedra* and *Leucojum* than between *Lapiedra* and *Galanthus*. The analogies are very considerable with species of *Leucojum* having a basic number of 7, particularly with *L. autumnale* L. Thus, we have suggested that *Lapiedra Martinezii* Lag. and *Leucojum autumnale* L. have originated from a common ancestor. The data concerning geographic distribution is not opposed to this conception.

BIBLIOGRAPHY

- Amico, A. 1947. Osservazioni su *Sternbergia lutea* Ker.-Gawl. *N. G. B. I.*, n. s., 54: 748-771.
- Battaglia, E. 1949. Diploidia e triploidia in *Sternbergia lutea* (L.) Ker.-Gawl. *Caryologia*, 1: 269-279.
- Boissier, E. 1839-1945. *Voyage botanique dans le midi de l'Espagne pendant l'annee 1837*. Paris.
- Colmeiro, M. 1858. *La botanica y los botanicos de la Peninsula Hispano-Lusitana*. Madrid.
- Colmeiro, M. 1889. *Enumeracion y revision de las plantas de la Peninsula Hispano-Lusitana e islas Baleares*, 5: Madrid.
- Darlington, C. D. and Janaki-Ammal, E. K. 1945. *Chromosome atlas of cultivated plants*. London.
- Fernandes, A. 1936. La mixoploidie chez *Narcissus reflexus* Brot. *Bol. Soc. Broteriana*, 11: (2.^a ser.) 27-42.
- Heitz, E. 1926. Der Nachweis der Chromosomen. Vergleichende Studien über ihre Zahl, Grösse und Form in Pflanzenreich I. *Zeits. Bot.* 18: 625-681.
- Herbert, W. 1837. *Amaryllidaceae*. London.
- Inariyama, S. 1937. Karyotype studies in *Amaryllidaceae* I. *Sci. Rep. Tokyo Bunrika Daigaku*. B. 52: 95-1113.
- Jahandiez, E., and Maire, R. 1931. *Catalogue des plantes du Maroc*. I, Alger.
- Lagasea, M. 1816. *Genera et species plantarum, quae aut novae sunt aut nondum recte cognoscuntur*. Madrid.
- Nakajima, G. 1936. Chromosome numbers in some crops and wild Angiosperms. *Jap. Journ. Gen.* 12: 211-218.
- Neves, J. B. 1939. Contribution a l'etude caryologique du genre *Leucojum* L. *Bol. Soc. Broteriana*. 13: (2.^a ser.) 545-572.
- Pax, F. 1888. *Amaryllidaceae* in Engler et Prantl *Die natürlichen Pflanzenfamilien*. II Teil (5). Leipzig.

- Satô, D. 1937. Polymorphism of karyotypes in *Galanthus* with special reference to the SAT-chromosome. *Bot. Mag. Tokyo*. 51: 242-250.
1938. Karyotype alteration and phylogeny. IV. Karyotypes in Amaryllidaceae with special reference to the SAT-chromosome. *Cytologia*. 9: 203-242.
1942. Karyotype alteration and phylogeny in Liliaceae and allied families. *Jap. Jour. Bot.* 12: 57-161.
- Stern, F. C. 1949. Chromosome numbers and taxonomy. *Proc. Linn. Soc. London*, Session 161, Pt. 2, 119-128.
- Trankowsky, D. A. 1930. Zytologische Beobachtungen über die Entwicklung der Pollanschläuche einiger Angiospermen. *Planta*. 12: 1-18.
- Traub, H. P. and Moldenke, H. N. 1947. The tribe *Galantheae*. *Herbertia*. 14: 85-116.
- Willkomm, M. and Lange, J. 1861-1880. *Prodromus Florae Hispanicae seu synopsis methodica omnium plantarum in Hispania sponte nascentium vel frequentius cultarum quae innotuerunt*. Stuttgartiae.
- Yamamoto. 1930. (Citation de Battaglia, 1949).

ALLIUMS LISTED IN SOME EUROPEAN BOTANIC GARDEN SEED EXCHANGES — 1951

BERNARD HARKNESS, *Chairman, Allieae Committee*
Highland Park Herbarium, Reservoir Ave., Rochester 20, New York

(1) Cantonspaark, Baarn. Botanical Garden, State University of Utrecht — HOLLAND; (2) Botanical Garden of the City and of the University of Caen — FRANCE; (3) Botanical Garden University of Zagreb — JUGOSLAVIA; (4) Botanic Garden of the University of Copenhagen — DENMARK; (5) Botanic Garden of Berlin-Dahlem — GERMANY; (6) Botanic Garden of Leiden — HOLLAND; (7) Botanic Garden of Munich — GERMANY; (8) Botanic Garden, Groningen — HOLLAND; (9) Botanic Garden, Gothenburg — SWEDEN; (10) Botanic Garden, Istanbul — TURKEY; (11) Botanic Garden of the University of Wurzburg — GERMANY; (12) Nikko Botanic Garden, Nikko — Japan; (13) Botanic Garden, Lund — SWEDEN; (14) Botanic Garden of the University of Helsinki — FINLAND; (15) Botanic Garden, Uppsala — SWEDEN; (16) Royal Botanic Garden, Edinburgh — SCOTLAND; (17) National Botanic Gardens, Glasnevin, Dublin — IRELAND; (18) Royal Botanic Garden, Kew — ENGLAND; (19) Botanic Garden of the University of Zurich — SWITZERLAND; (20) Botanic Garden of the City of Dijon — FRANCE; (21) Jean Massart Experimental Garden, University of Brussels — BELGIUM.

ALLIUM

acuminatum—16; *acutangulum*—20; *albidum* (denudatum)—4; *albopilosum*—6—7—9—17—18; *ampeloprasum*—6; *ampeloprasum* var. *leucanthemum*—18; *amplectens*—4; *angulosum*—1—8; *aschersonianum*—16; *atropurpureum*—4—16.

beesianum—1—16—17—18; *bidwelliae* (campanulatum)—16—18; *bulgaricum*—18; *bulleyanum*—16.

caeruleum—7—14—16—18; *caeruleum* var. *bulbilliferum*—9; *canadense*—1—4; *carinatum*—3—4—5—6—7—19—20; *cepa*—6—20—21; *cepa* var. *proliferum*—4—7—9; *cernuum*—4—6—9—15—16—17; *cernuum* var. *major*—16; *ciliatum* (subhirsutum)—17; *cilicicum*—7; *condensatum*—9; *cyaneum*—5—7—9—15; *cyrilli*—1—18.

dahuricum—17; *darwasicum*—15—17; *darwasicum album*—17; *decipiens*—6; *delicatulum*—4.

E, F, G, H, I, J, K & L. elatum—18; *farreri*—7—9—15—16—18; *fistulosum*—4—6—7—8—13—14—16—18—20; *fistulosum* f. *grande*—15; *flavum*—5—6—9—20; *forrestii*—1; *giganteum*—6—7—15—18; *glaucum*—18—20; *heldreichii*—1; *huteri*—7; *hymenorrhizum*—4—13—15; *insubricum* (narcissiflorum)—7; *jerdianum*—4; *Kansuense*—5; *karataviense*—4—5—8—9—13—14—15—16—17—18—21; *libani*—1.

macranthum—7—9—16; *magicum* (nigrum)—14; *margaritaceum*—6; *moly*—1—6—9—18; *moly* var. *bulbiferum*—7; *monophyllum*—16; *montanum* (senescens)—20; *multibulbosum* (nigrum ?)—9.

narcissiflorum—7—15—16—18—21; *neapolitanum*—6—16—21; *nigrum*—6.

obliquum—4—7—13—14—15—18—19—20; *odorum*—1—4—6—7—9—15—16; *oleraceum*—1—2—4—8—20; *olympicum*—10; *ophioscorodon* (scorodoprasum)—7; *oreophilum*—4—13—15—16; *oreoprasum*—4; *orientale*—5; *ostrowskianum*—7—8—16—18—21; *oxyphilum*—16.

paniculatum—6—8; *paniculatum* var. *longispatum*—4; *paradoxum*—4; *platyspathum*—15; *polyastrum*—16; *polyphyllum*—17; *polyrrhizum*—7—8; *porrum*—4—6—8—20—21; *przewalskianum*—9—15; *pskemense*—4; *pulchellum*—4—7; *purdomi*—9.

ramosum—18; *rosenbachianum*—4—13—16—17—20; *roseum*—5—6—17—20; *rotundum*—1—7—20; *rubrum*—6—16.

sativum—8—18—20; *sativum* var. *vulgare*—7; *schoenoprasum*—1—3—4—5—14—17—18; *schoenoprasum* var. *sibiricum*—9—10—15—16—18; *scordoprasum*—4—13—16—17—20; *scorzonerifolium*—18; *senescens*—4—6—9—10—13—15—16—17—18—19; *senescens* var. *glaucum*—17—18; *siculum*—4—17—18; *sphaerocephalum*—6—11—14—17—19—21; *stellerianum*—9; *stenanthum* (bolanderi)—17; *stipitatum*—4—6—7—16—19; *suavolens*—7; *subhirsutum*—6; *suworowii*—7.

thibeticum—5—17; *thunbergii* (japonicum)—12; *triquetrum*—17; *tuberosum*—18.

U, V, W, Y & Z. unifolium—16; *ursinum*—3—4—18—21; *victoralis*—5—6—7—9—13—14—15; *villarsii*—6—15; *vineale*—2—4—9—16—20; *wallichianum*—9—16; *yunnanense* (mairei)—9—16; *zebdanense*—4—7—8—15—18—21.

VALLEEVUE AMARYLLIS TRIALS — 1951

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Western Reserve University

[FOR FIRST REPORT SEE PLANT LIFE (HERBERTIA EDITION) 7: 71—75. 1951.]

During the second season of the amaryllis strain trials test, observations were made to determine the ability of the varieties to recover from the forcing practices used to bloom the plants for the Cleveland Flower Show of 1950. Inasmuch as the varieties were forced into bloom in 60 days from potting, it was interesting to note the ability of the plants to recover and bloom this season. During the vegetative season the plants were watered regularly and received weekly applications of liquid cow manure plus 1 tablespoon of 5-10-10 per 8" pot each month, May through August.

Practically all the plants developed from 12 to 16 leaves during the season with bulb development equal in size or larger than those received from Holland.

Bulbs for trial from Ludwig & Co., Hellegom, H. DeGraaff & Son, Lisse, and Warmenhoven & Son, Lisse, Holland were repotted late in December after an 80-day rest period, during which time the foliage completely died down. The soil mixture used was equal parts of sand, clay loam, compost and rotten cow manure with one tablespoon of bone meal per pot. Watering began on January 1, 1951 with a blooming period of the Cleveland Flower Show on February 24 as the objective of the forcing period for the first scapes. The response to forcing the second season was not as uniform as the previous year; however, a large majority were in bloom for the show.

The named varieties of amaryllis vegetatively propagated represent the finest types of this flower available today. Five bulbs of each variety were studied to note variances in color or form. Care was taken to determine which variety was superior when certain named varieties nearly identical in color were observed. Due to the time and labor involved in the vegetative propagation of these bulbs it would appear more desirable to have just a few named varieties of very high quality and distinctiveness rather than the large number of similarly colored varieties available today.

The rating for 1951 tends to emphasize the very best of each color so that they may be recognized as superior. Based on our records, these should be used as standards for future selection and comparison for respective colors.

The letter rating of AA—Superior; A—Excellent; B—Good; C—Fair, for discard is based on clean color, floret size, number of scapes per

bulb, number of florets per scape, floret form, floret substance, length and texture of scape and vigor of bulb and foliage.

SALMON

MONA LISA (Ludwig). A salmon, suffused pink. Color irregular and fades, 2 scapes 15", 3 to 4 five and one half inch blooms. 1950 rating—C; 1951—C.

QUEEN'S PAGE (Warmenhoven). Clean salmon orange. 3 scapes, 20" tall with 4 eight inch blooms. Rating 1950—A; 1951—AA.

SALMONETTE (Warmenhoven). Listed in 1950 as Salmon Joy, a name duplication. Clear salmon with deeper salmon in throat. 2—3 scapes 24" tall with 4 to 6 eight inch blooms. Rating 1950—A; 1951—A.

SALMON JOY (Ludwig). Salmon scarlet, blending to deep red at base of petals, occasionally scratchy white line on throat, heavily sub-stanced floret, wide open. 3 scapes, 22" tall with 4 nine inch blooms. Rating 1950—A; 1951—A.

SWEET SEVENTEEN (Warmenhoven). Frosty salmon rose on white, giving a flesh pink tone to the floret. 3 scapes, 20" tall with 4 nine inch blooms. Rating 1950—B; 1951—A.

ORANGE SCARLET

BORDEAUX (Warmenhoven). Clean light orange scarlet, blending to deep scarlet in throat. 2 scapes, 26" tall with 4 ten inch florets. Rating 1950—A; 1951—A.

CARUSO (Ludwig). Orange scarlet intensifying at base of petals, slight striation at base of petals. 2—3 scapes, 24" tall with 4 eight inch blooms. Rating 1950—B; 1951—B.

INVINCIBLE (Ludwig). Smooth orange scarlet, blending to deep red in throat. 2—3 scapes, 22" tall with 4 nine inch florets. Rating 1950—A; 1951—AA.

SCARLET

FIRE KING (Ludwig). Scarlet, deepening to medium red in throat, floret long tubed. 2—3 scapes, 18" tall with 4 six inch florets. Rating 1950—B; 1951—A.

HALLEY (Ludwig). Clean, frosty scarlet with great substance and growth. 3 scapes, 22" tall with 3—4 eight and one half inch florets. Rating 1950—AA; 1951—AA.

LUDWIG'S SCARLET (Ludwig). Glistening scarlet, blending to deep red in throat, color breaks to yellow green at base of petals. 3 scapes, 26" tall with 4 seven and one half inch blooms. Rating 1950—B; 1951—B.

PRINCE OF ORANGE (Warmenhoven). Scarlet, blending deep in throat, fades as floret ages. 3 scapes, 19" tall with 3—4 eight inch blooms. Rating 1950—B; 1951—B.

SCARLET BEAUTY (Warmenhoven). Scarlet, blending to medium red to dark red in throat. Possesses a velvety sheen that glistens. 3 scapes,

24" tall with 4 nine inch blooms. Rating 1950—A; 1951—AA.

SCARLET LEADER (Ludwig). Scarlet suffused with red, suffusion lines intensifying in throat. 3 scapes, 22" tall with 4 seven inch blooms. Rating 1950—B; 1951—A.

SCARLET TRIUMPH (Warmenhoven). Clear scarlet appearing nearly light red. Exceptional leathery substance to florets. 3 scapes, 24" tall with 4 ten inch florets. Rating 1950—A; 1951—A.

PINK

DORIS LILIUM (Ludwig). Light rose pink deepening to rose in throat, very heavy substance. 3 scapes, 20" tall with 4 six inch blooms. Rating 1950—A; 1951—A.

FIDELITY (Ludwig). Pale rose pink with green at base of petals, clean color. 3 scapes, 14" tall with 3 to 4 five inch blooms. Rating 1950—B; 1951—B.

LIBERATOR (Ludwig). Salmon rose with deep rose red throat, mid ribs of lower petals white. Color appears as a suffusion of rose salmon on white giving a netted appearance. 3 scapes, 26" tall with 3—4 seven inch blooms. Rating 1950—B; 1951—B.

DEEP ROSE

FANTASY (Ludwig). Rose and white bicolor, each petal has marginal half rose and throat creamy white. 2 scapes, 20" tall with 4 five and one half inch blooms. Rating 1951—B.

PINK PERFECTION (Ludwig). Clear medium rose with lighter color toward the margin of the petals giving a pink halo effect. 2—3 scapes, 30" tall with 4 seven inch blooms. Rating 1951—A.

VIOLETTA (Warmenhoven). Medium to deep rose with a light rose throat. Light rose midribs. 3 scapes, 22" tall with 3—4 eight inch florets. Rating 1950—B; 1951—B.

LIGHT AND MEDIUM RED

AMERICAN EXPRESS (Ludwig). Huge, clean, medium red blending into deep red in throat. Substance excellent for large floret. 2 to 3 scapes, 28" tall with 4 ten inch florets. Rating 1950—AA; 1951—AA.

ANNA PAULOWNA (Warmenhoven). Glistening light salmon red with deep red throat. Fades as it ages. 2 to 3 scapes, 26" tall with 4 eight inch florets. Rating 1950—B; 1951—A.

BRILLIANT (Ludwig). Very thick leathery light red with deep red in throat, occasional irregular white line on lip petal. 3 scapes, 24" tall with 4 six inch florets, Rating 1950—B; 1951—B.

MOTHERS DAY (Ludwig). Medium rose red, deepening to crimson red in throat with white striping at base of petal. Irregular flecks of darker red to violet red appear in petals. 2—3 scapes, 20" tall with 3—4 six-inch florets. Rating 1950—B; 1951—B.

ORANGE KING (Warmenhoven). Light red that loses its color as the florets age giving a blue gray sheen. 2—3 scapes, 18" tall with 4 eight inch florets. Rating 1950—B; 1951—A.

ORANGE WONDER (Ludwig). Light red blending into a pink to white throat. Color combination is odd and blending not too smooth. 2 scapes, 21" tall with 4 five inch florets. 1950—C; 1951—B.

SHAKESPEARE (Ludwig). Glistening medium red, blending to deeper red in throat, white line on some petals most prominent in throat. 3 scapes, 18" tall with 4 six inch florets. Rating 1950—A; 1951—A.

DARK AND WINE RED

LUCIFER (Warmenhoven). Medium dark red of great substance. 2 scapes, 19" tall with 4 eight inch florets. Rating 1950—B; 1951—B.

MORENO (Warmenhoven). Medium dark red with flight suffusion of rose red in throat. 3 scapes, 26" tall with 4 eight inch florets. Rating 1950—AA; 1951—A.

MYSTERIE (Warmenhoven). Rose red, blending to deep red in the throat. Midribs and tips of petals are rose. 2 scapes, 20" tall with 4 seven inch florets. Rating 1950—B; 1951—B.

RED MASTER (Warmenhoven). Huge dark red of great substance with flat florets. This variety possesses the deepest color of any amaryllis tested up to the present. Its floret size may be due to its inability to hold over 3 florets per scale. 2 scapes, 24" tall with 2—3 eleven to twelve inch blooms. Rating 1950—AA; 1951—AA.

WHITE

CASPER LUDWIG (Ludwig). Pure white with yellow green line in throat. 3 to 4 scapes, 16—20" tall with 4 five inch blooms. Rating 1950—B; 1951—B.

EARLY WHITE (Ludwig). Very early pure white with faint green tinge deep in throat, good substance. 3 scapes, 22" tall with 4 to 5 six and one half inch blooms. Rating 1950—A; 1951—A.

JOAN OF ARC (Warmenhoven). Pure glistening white with green in throat. 2—3 scapes, 24" tall with 4 to 6 seven and one half inch blooms. Rating 1950—A; 1951—A.

LEADING LADY (Warmenhoven). Wide open pure white with green throat. 3 scapes, 20" tall with 3 to 4 seven inch blooms. Rating 1950—B; 1951—B.

MOUNT TACOMA (Warmenhoven). Pure white with faint green tinge in throat. Petals are winged at base, 3 scapes, 24" tall with 4 seven inch blooms. Rating 1950—A; 1951—A.

QUEEN OF THE WHITES (Warmenhoven). Glistening waxy pure white with faint tinge of green in throat, blooms flat with slight recurve at tip. 3 scapes, 25" tall with 4 to 5 nine inch blooms. Rating 1950—AA; 1951—AA.

SNOW QUEEN (Ludwig). Pure white with faint green tinge. 3

scapes, 18" tall with 4 five and one half inch blooms. Rating 1950—B; 1951—B.

WHITE GIANT (Ludwig). Early pure frosty white with green tinge in throat. 3 scapes, 24" tall with 5 six inch blooms. Rating 1950—A; 1951—A.

WHITE STRIPED

KING OF THE STRIPES (Warmenhoven). Frosty pale pink to white with two broad undefined lines of carmine shading to vermilion in throat on each petal. 3 scapes, 24" tall with 3—4 five inch blooms. Rating 1950—A; 1951—A.

STRIPED BEAUTY (Warmenhoven). Orange scarlet lines that cover a large part of the petal giving the appearance of a white border. 3 scapes, 20" tall with 3—4 six inch blooms. Rating 1950—B; 1951—A.

The separate colored amaryllis of H. DeGraaff & Son will be included in the 1952 report. These will be compared with the named varieties and with several other strains on the market, sold according to color.

ZEPHYRANTHES CLINTIAE SP. NOV.

HAMILTON P. TRAUB, *Maryland*

This beautiful *Zephyranthes* species was collected by Mr. & Mrs. Morris Clint of Brownsville, Texas. With reference to the locality of collection Mrs. Clint writes, "Our bulbs were collected on the same day in two widely different areas in the States of San Luis Potosi, and were not labeled in the field. However, as only a few bulbs were dug in the first region and the majority of our bulbs have proved to be M-471 (= *Zephyranthes clintiae* Traub, *sp. nov.*), I feel it safe to assume that M-471 came from our second stop, a semi-arid country just a few miles east of Cuidad del Maiz, near the San Luis Potosi Highway about 45 miles from Antigua, Morelos, which is on the Pan American Highway, altitude approximately 4000 feet [Plate 7]. The trees are mostly scrub oak and there is very little or no undergrowth. An unlikely place for most orchids, but well suited for *Laelia majalis* (*L. grandiflora*) and *Epidendrum mariae* Ames. Our bulbs were gathered along a small lightly shaded canyon (Canyon de Borrego) leading away from the highway. There were only scattered single specimens, all blooming without foliage. The soil in the canyon was rather heavy but very gritty and well drained and covered with a good layer of leaf mold. Exposed to the full rays of the sun, a rather steep, rocky slope nearby was literally



Zephyranthes clintiae Traub, sp. nov.

Photo by Mr. Morris Clint.

ablaze with *Zephyranthes* blooms, but we did not gather any there at the time."

This species appears to be of the easiest culture and should become a standby out of doors in southern climates, and a fine pot plant in the North. The species has been appropriately named in honor of Mrs. Morris Clint, an enthusiastic plant explorer and gardener in the Lower Rio Grande Valley of Texas.

Zephyranthes clintiae Traub. sp. nov.

Herba bulbosa; foliis angustis usque ad 47 cm. longis, 2—3 cm. latis; umbella uniflora; floribus erectis ab roseis usque ad roseo-purpureis variis; spatha in parte inferiore 2/3 connata, supra bifida, usque ad 2.6 cm. longa; pedicello 1.7—2.6 cm. longo; tubo tepalorum 1.9 cm. longo sursum ampliato; segmentis tepalorum spathulato-oblongatis 2.5—3 cm. longis, 1.3—1.7 cm. latis; staminibus 1—1.2 cm. longis; stylo staminibus longioribus 2 mm. brevioribus; stigmate trifido, lobis globulosis. Traub nos. 202 & 203; Plate 6.

Bulbous herb; leaves narrow concave on upper surface, erect, rush-like, up to 47 cm. long, 2—3 mm. wide; peduncle 16.5—19.5 cm. tall at anthesis, elongating up to 43 cm. in fruit; umbel 1-flowered; flowers upright, up to 4.9 cm. long, varying in color from Tyrian Rose (RHS 24/2) to Solferino Purple (RHS 26/1); spathe purplish, united in lower 2/3, bifid above, 2.5—2.6 cm. long; pedicel 1.7—2.6 cm. long; ovary 5—7 mm. long; tepaltube 1.9 cm. long, enlarging upwards; tepal-segs spatulate-oblongate, 2.5—3 cm. long, 1.3—1.7 cm. wide; stamens, style and stigma white; stamens of 2 different lengths, 1 cm. and 1.2 cm., long; anthers versatile; style 2 mm. shorter than longer stamens; stigma trifid, lobes short, globulose; capsule about 1.2 x 2 cm.; seeds numerous, black. Type: Traub nos. 202 and 203; in the Traub Herbarium; type illustration: Plate 6.

RANGE.—Mexico; a few miles east of Ciudad del Maiz, Morelos, San Luis Potosi.

NOTES.—Flowered in July, Aug., Sept., and Oct. 1951. This species is similar to *Zephyranthes fosteri*, with sessile ovary, but *Z. clintiae* can be easily distinguished by its 1.7—2.6 cm. long pedicel. Mrs. Clint has observed one flower of *Z. clintiae* with a 4-lobed stigma.

EXPLORING FOR MEXICAN ZEPHYRANTHES

MRS. MORRIS CLINT, *Brownsville, Texas*

On an orchid collecting expedition in Mexico during April of 1947, my husband and I were lucky enough to find in bloom some very interesting *Zephyranthes*. Fortunate, indeed, as on numerous visits to the same territory not a single blossom could we find.

We spotted our first bulbs along the San Luis Potosi Highway, about 25 miles from Antigua, Morelos, in a tropical rain forest area. Altitude is approximately 2500 feet. Mountains are heavily wooded with giant oak trees, which are covered with various mosses, ferns, bromeliads and orchids. During the months of October and November flower sprays of the lovely *Laelia anceps* turn this place into a veritable fairyland. Our bulbs chose the more open spaces, where they received a fair amount of sunlight. They were growing singly in small soil pockets between rocks in the bar pits at the foot of the mountain. Soil was a rich sandy loam, covered with a thick layer of leaf mold. We gathered only a few bulbs, as they were widely scattered and hard to dig, and twenty-five miles of difficult mountain driving still remained ahead of us before reaching our destination, the "Majalis Country."

Here, indeed, is a completely different region. Not far from Ciudad del Maíz, the home of the very beautiful *Laelia majalis* (*L. grandiflora*) and the lovely *Epidendrum mariae* Ames is on the dry side of the mountain range. Altitude is about 4000 feet. This area appeared barren and desolate to us after the lush tropical beauty of the "Anceps Country," so imagine our surprise and delight to find *Zephyranthes* blossoms literally everywhere. There were several large colonies growing in full sun in the corral of the ranchito where we stopped for guides; there were scattered blooms in the semi-shade of nearby Canyon del Borrego, and a rocky slope between these areas was ablaze with their color. Two neighboring mountains were explored for superior varieties of *Laelia majalis* but no rain lilies were observed. Perhaps their range was confined to a comparatively small area, one half mile across, or possibly the adjacent regions had not received the same recent shower. Soil on the slope was a light sandy loam, while that in the valleys was heavier and roughly gritty.

We soon noticed that the flowers varied rather widely in color and form, so we endeavored to collect each variation seen. Cultivation appears to have enhanced these differences. Flowers were small, pink to rose red, and were carried on five or six inch stems. All were blooming without leaves.

In our garden they have adapted themselves quite nicely. They become temperamental only when a few necessary requirements are not given, sulking underground for months after being over watered, or



Plate 7 Habitat of *Zephyranthes clintiae* Traub.

(Upper) View of Valley known as "Puerto de Lobos," taken from slope where we have gathered many of our *Zephyranthes*, including M-471 (*Zephyranthes clintiae* Traub), also *Laelia maja'is* and *Epidendrum mariae* Ames. Elevation approx. 4500 ft., 50 miles from Antigua, Morelos, on San Luis Potosi Highway, in the State of San Luis Potosi.

(Lower) Looking toward south from part way up slope. This territory is on the western or dry side of mountain; bushes in foreground are scrub huisache. Around the next bend in the road is Canyon de Borregos, Ciudad del Maiz, about 3 miles away.

gradually wasting away in too much shade. With us, they are virtually evergreen. Bloom is always contemporary with the leaves and is not limited by rainfall. Bulbs frequently send up intermittent off season flowers, but our heaviest bloom is in July and August. Our blossoms range from a light pink with a white center to a dark wine red. Seeds set easily except on one type, which has so far defied all efforts. This variety has a large cup-shaped flower, light salmon pink in color.

In August of this same year my son, Morris, Jr., found a small colony of a very charming rain lily growing in a creek bed near El Sol, which is a few miles north of Tamazunchale in the southern tip of the State of San Luis Potosí. As search for others in the immediate neighborhood proved fruitless, we wonder if these few bulbs or their seed were not washed down from their natural home, perhaps many miles away. The flowers are quite large for a *Zephyranthes*, near RHS Fuchsine Pink 627/2, with a white center, and are carried on tall, stout stems. They appear in the absence of leaves, during late June, July and August. The blooms last for several days, which is rather unusual in this locality. Seeds are freely produced.

Very shortly after our bulbs were collected, the Mexican Government was forced to institute a strict quarantine against the transportation of plants and fruit within their borders in an effort to prevent the spread of the Black Fly, a serious menace to their citrus industry. We are hoping complete control of this pest will soon allow us once more to go in search of our elusive little *Zephyranthes*.

Meantime, Dr. Traub is studying our bulbs and will shortly tell us more about them.

(EDITORIAL NOTE.—Since this was written in December 1950, one of the species has been determined as new to science and has been named, *Zephyranthes clintiae* as reported in the preceding paper.)

LYCORIS NOTES

HAMILTON P. TRAUB, *Maryland*

Some progress has been made toward clearing up the nomenclature of the *Lycoris* species now being grown and propagated in Europe and the United States. Mr. Sam Caldwell, of Nashville, Tenn., and Mr. Wyndham Hayward, of Winter Park, Florida, both enthusiastic lycoris growers, are assisting with the project to solve the remaining *Lycoris* name problems.

Under date of August 12, 1950, Mr. Caldwell writes, "This is just to advise you that I have now had bloom stalks on two groups of *Lycoris incarnata* bulbs—both from van Tubergen in Holland. One group of three has been in an 8-inch pot since 1947; the other group of seven was



Lycoris straminea Lindl. (?). Photo by Mrs. Cecil Houdyshel.

Plate 8

planted outside in the ground last fall. There is just one stalk from each group, but it is the first time I have had a bloom on any of my bulbs labeled "*L. incarnata*." The flowers are identical with those on the bulbs received from Wyndward Hayward, labeled "*Lycoris squamigera purpurea*"—examples of which I sent you by air mail last week. You had tentatively identified these from my kodachromes as *Lycoris incarnata*, and now the flowering of van Tubergen's *Lycoris incarnata* confirms your verdict. It is good to get at least a little confusion cleared up. Now with Hayward's *Lycoris squamigera purpurea* turning out to be *L. incarnata*, and Houdyshel's *Lycoris purpurea* turning out probably to be *L. sprengeri*, as you suggested, we'll have to wonder just who does have and what is the real *Lycoris squamigera purpurea*."

Under date of August 28, 1950, Mr. Caldwell writes, "Here's a little additional information on the lycoris season here: On August 22 I had three scapes on my outdoor planting of '*Lycoris purpurea*' from Cecil Houdyshel. They were very beautiful. We have had much cool, rainy weather, and the intense blue, so evident in these flowers last year, was even more prominent this season. At the same time my single potted bulb of *L. sprengeri*, from van Tubergen, bloomed for the first time—a single scape with 6 flowers in the umbel. It is *identical* with the Houdyshel lycoris, confirming again your opinion based on an examination of my Kodachromes some time ago, that Houdyshel's "*L. purpurea*' is really *L. sprengeri*. This is a fine lycoris—about a month later to bloom with us than *L. squamigera*—and apparently suitable both for pot and outdoor culture in this climate, which I believe is a little more severe in the winter than that of Washington, D. C. The scapes are about 17 inches tall; of the four, one had five flowers, two had six and one had seven. I think they are going to make good seeds—they did last year, though I lost the seedlings from damping off."

Thus it will be noted that *Lycoris incarnata* and *L. sprengeri* have been identified. The reader is referred to Plate 14, page 171, Traub & Moldenke, AMARYLLIDACEAE: TRIBE AMARYLLEAE. 1949, for good illustrations of these two species. In *Lycoris incarnata* the apexes of the tepalsegs are acute, and the color is soft flesh-colored, or light rose; whereas in *Lycoris sprengeri* the apexes of the tepalsegs are more rounded, the color defies description—polychrome, vivid-rose in the throat, otherwise purple and carmine with suffusions of Prussian Blue, Cyanin Blue).

Over a hundred years ago, Lindley described *Lycoris straminea* Lindl. (in Jour. Hort. Soc. Lond. 3: 76. 1848; descr. in Traub & Moldenke, AMARYLLIDACEAE: TRIBE AMARYLLEAE. 1949, page 178). This species was never illustrated and so far all attempts by the writer to locate plants of this species have failed. However, Mr. Caldwell, under date of Aug. 28, 1950, also reported that he has flowered a "faintly strawy colored" species, which he originally obtained from Bob Anderson of Los Angeles, now deceased." This may be the long lost *Lycoris straminea*. The bulbs introduced by the USDA as *Lycoris albiflora*, now supplied by Cecil Houdyshel, of La Verne, Calif., may also belong here

[Plate 8]. Hayward, in a private communication states that the flowers are "nearly clear white." It is hoped that those who are interested in *Lycoris* will report their experiences so that the remaining confusion of names may be straightened out in the near future.

AMARYLLID NOTES

HAMILTON P. TRAUB, *Maryland*

Haemanthus longifolius (De Wild. & Th. Dur.) Traub, **comb. nov.**; syn.—*Demeusea longifolia* De Wild. & Th. Dur., in Bull. Soc. Bot. Belg. 39: 78—79. 1900.

xHaemanthus nicolaii Traub, **hybr. nov.**, syn.—*Haemanthus hybridus* Wittmack, in Gartenflora (1900), p. 113, pl. 1472, fig. 19c & 20c. (*H. puniceus* ♀ et *H. katherineae* ♂).

Hymenocallis caymanensis Herb., Amaryll. 214. 1837, [syn.—*Hymenocallis keyensis* Small, S. E. Flora, pp. 322, 1503. 1933, *nomen subnudum* (Small failed to indicate the width of the leaves, a necessary diagnostic character in this genus.). Leaves 3.2 cm. wide at the base, (7)—7.5 cm. wide somewhat above the middle, apex acute; umbel (6)—10—16—flowered. Type: Chapman, So. Fla. cult., nos. 325 and 326 (= U. S. Nat'l Herb. nos. 932753 and 932754). Here belongs also Chapman, So. Fla. cult., sandy coast, 1875 (= U. S. Nat'l Herb. no. 968975).]

Subgenera and sections of Zephyranthes. In the past it has sometimes been the practice to establish a new genus whenever some interesting structural difference or differences were observed in plant species, without insisting that such a difference or differences *must represent a distinct gap* if they are to be used as the basis of generic distinction. One of the most glaring examples is of course the attempt of Herbert to elevate *Brunsvigia rosea*, the Cape Belladonna, to generic rank for purely sentimental reasons, on the basis of slight specific differences only. In the genus *Zephyranthes*, the genus *Cooperia* Herb., was based primarily on the presence of a relatively long tepaltube and erect anthers. Later it was shown that gene exchange (crossing) can take place between this group and the typical section of *Zephyranthes*, and that there are species intermediate between the two. This was recognized by D. Don as early as 1836. Similarly, the differences between the typical section of *Zephyranthes* and two other groups are not sufficient for generic distinctions. *Pyrolirion* Herb., was reduced to a subgenus of *Zephyranthes* by Baker (1888) on that basis, and *Haylockia* Herb., is similarly reduced here in harmony with the proposal of D. Dietrich (Syn. Pl. 2: 1176. 1840). The expanded genus *Zephyranthes*, recognizing the propo-

sals of D. Don (1936), Baker (1888) and the proposal of Dietrich (1840), concerning *Haylockia* Herb., which is a *Zephyranthes* with the peduncle hidden in the neck of the bulb, is summarized in the following key to the subgenera and sections.

KEY TO THE SUBGENERA AND SECTIONS OF THE GENUS ZEPHYRANTHES

Genus ZEPHYRANTHES: perigone limb radially symmetrical; stamens subequal or of two sets of lengths; tepalsegs subsimilar [type: *Z. atamasco* (L.) Herb.].

- 1a. Anthers dorsifixed, versatile; perigone erect, suberect or horizontal; tepaltube usually short:
- 2a. Stamens subsimilar; upper portion of tepaltube dilated; style straight; stamens erect to suberect; anthers medianally dorsifixed [type: *Z. tubiflora* (L'Herit.) Schinz]:

Subgenus I. PYROLIRION (Herb.) Baker
Amaryll. 30: 37—38, 1888.

- 3a. Peduncle longer than the neck of the bulb [type: *Z. tubiflora* (L'Herit.) Schinz] Sect. 1. EUPYROLIRION Traub
PLANT LIFE 7: 43. 1951.
- 3b. Peduncle included in the neck of the bulb [type: *Z. pseudocolchicum* Kraenzl] Sect. 2. BRACHYLIRION Traub
PLANT LIFE 7: 43. 1951.
- 2b. Stamens of two sets of lengths:
- 4a. Peduncle longer than the neck of the bulb; [type: *Z. atamasco* Herb.].....

Subgenus II. EUZEPHYRANTHES Aschers. & Graebn.

- 5a. Perigone erect or suberect; stamens erect or suberect:
- 6a. Functional stamens 6:
- 7a. Stigma trifid, lobes filiform
[type: *Z. albiella* Traub] Sect. 1. FILISTIGMANTHES Traub
sect. nov. stigmatate trifido, lobis filiformibus.
- 7b. Stigma trifid, lobes not filiform
[type: *Z. atamasco* (L.) Herb] Sect. 2. ATAMASCO (Adan. ex
Greene) Traub, PLANT LIFE 7:43. 1951.
- 6b. Functional stamens 3:
[type: *Z. minima* Herb.] Sect. 3. TRISTEMANTHES Traub
PLANT LIFE 7: 43. 1951.
- 5b. Perigone, stamens and style horizontal
[type: *Z. bifolia* (Aubl.) Roem.] Sect. 4. SIBONAYA Traub
PLANT LIFE 7: 43. 1951.
- 4b. Peduncle hidden in the neck of the bulb [type: *Z. pusilla* Dietr.]:

Subgenus III. HAYLOCKIA (Herb.) Traub
PLANT LIFE 7: 43. 1951. [not divided into sections]

- 1b. Anthers erect, basifixed; perigone erect; tepaltube usually relatively long
[type: *Z. brazosensis* Traub. PLANT LIFE 7: 43. 1951]:

Subgenus IV. COOPERIA (Herb.) Traub
PLANT LIFE 7: 43. 1951.

- 8a. Filaments free [type: *Z. brazosensis* Traub] Sect. 1. EUCCOOPERIA Traub
PLANT LIFE 7: 43. 1951.
- 8b. Filaments slightly united in lower part
[type: *Z. albicans* (Herb.) Baker] Sect. 2. PARANDRANTHES Traub
PLANT LIFE 7: 40. 1951.

The classification of the species within the subgenera and sections is relatively easy, except for the sections *Atamasco* and *Filistigmanthes* of the subgenus *Euzenphyranthes*. This is due to the incomplete or faulty description of the stigma in many cases in the literature. It will be necessary to examine the type specimens whenever possible to bring order out of the present chaos since the unreliable criterion of the relative length of the perigone was largely used by Baker (1888) in his classification.

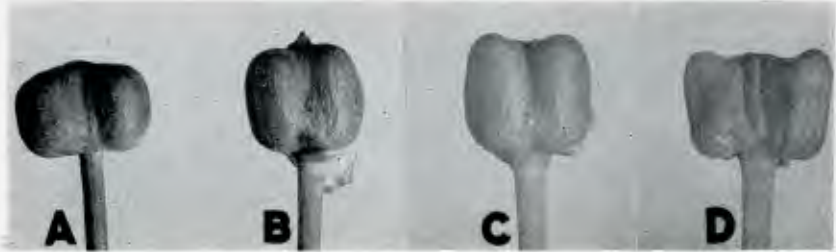


Fig. 12. *Zephyranthes*, subgenus *Cooperia*, seed capsules (A) *Zephyranthes brazosensis* Traub; (B and C) *Zephyranthes brazosensis* var. *chlorosolen* (Herb.) Traub, *comb. nov.*; and (D) *Zephyranthes brasiliensis* Traub. All approx. natural size.

Zephyranthes seed capsules. In the subgenus *Cooperia*, of the genus *Zephyranthes*, the seed capsules are of real diagnostic value since they are quite distinctive for most species. In Fig. 12, the seed capsule of *Zephyranthes brasiliensis* (Fig. 12-D) from Brasil, is compared with those of *Zephyranthes brazosensis* Traub (syn.—*Cooperia drummondii* Herb.) (Fig. 12-A) collected in Texas, and its variety, *Zephyranthes brazosensis* var. *chlorosolen* (Herb.) Traub, *comb. nov.* (syn.—*Cooperia chlorosolen* Herb., Bot. Reg. Lond. plate 1835. 1836) (Fig. 12-B & C), from two different localities in Texas.

REGISTRATION OF NEW AMARYLLID CLONES

Registrars: Dr. J. B. S. Norton and Prof. W. R. Ballard

This information is published to avoid duplication of names, and to provide a space for recording brief descriptions of new Amaryllid clones. Names should be as short as possible—one word is sufficient. It is suggested that in no case should more than two words be used. *The descriptions must be prepared in the form as shown in the entries below, and must be typewritten and double-spaced.* The descriptive terms used

should be in harmony with those given in the "Descriptive Catalog of Hemerocallis Clones, 1893-1948" by Norton, Stuntz and Ballard.

There is close liaison between the AMERICAN PLANT LIFE SOCIETY and the HEMEROCALLIS SOCIETY regarding the registration of new *xHemerocallis* clones. By cooperative arrangement with the HEMEROCALLIS SOCIETY, beginning with the 1951 HERBERTIA edition, descriptions of only such *xHemerocallis* clones for which the registration fee has been paid to Registrar, Mr. Wilmer B. Flory, 1533 Meadowlawn Ave., Logansport, Ind., will be registered, and numbered (example: 3322-R). The number "3322" indicating the number of the clone and the "R," the information that it is registered. The registration fee is required *only* in the case of *xHemerocallis* clones, and *not* for other amaryllids which are registered free of charge by the AMERICAN PLANT LIFE SOCIETY. It should be noted that in a free country such as ours, registration is *entirely voluntary*, and does not replace the right of anyone to publish names with descriptions in recognized publication media elsewhere and thus obtain priority under the generally recognized INTERNATIONAL RULES OF BOTANICAL NOMENCLATURE which cover all plant names.

Correspondence regarding new amaryllid clones, including *Hemerocallis*, to appear in HERBERTIA should be addressed to Prof. J. B. S. Norton, 4922 40th Place, Hyattsville, Maryland, *enclosing self-addressed, stamped envelope, if reply is expected.*

For obvious reasons, there is a limit to the number of descriptions included from any one member in any one issue. Not more than six brief descriptions of clones under each generic heading will be published from any one member in any one issue of HERBERTIA. Descriptions of clones in excess of five brief descriptions, up to a total of 25, will be entered if the space required for each is limited to one line. In this case use should be made of the standard abbreviations already mentioned.

HYBRID ALSTROEMERIAS

xAlstroemeria racinae Traub, *hybr. nov.*

Described and illustrated, by M. B. Foster, in PLANT LIFE 6 (HERBERTIA): 86—87, plate 13. 1950. (*A. caryophyllaea* Jacq. x *A. pulchella* L. f.). This fine fragrant hybrid has been appropriately named in honor of Mrs. Racine Foster (Mrs. Mulford B. Foster), of Orlando, Florida.—*Hamilton P. Traub*

xCRINODONNA CLONE

xCrinodonna corsii clone DOROTHY HANNIBAL, Traub, *cl. nov.*

[*Crinum moorei* x *Brunsvigia rosea* var. *minor*]—Planta bulbosa; bulbo satis parvo; foliis lanceolatis 5.8—8.5 dm. longis, medio 4.2—4.8 cm. latis; pedunculo complanato 54 cm. alto, marginibus rotundatis; umbella 18-flora; spatha bivalvata ca. 10 cm. longa; pedicellis 2.5—6 cm. longis; ovario 1.5 cm. longo; flore rubello; tubo tepalorum 4—4.8 cm. longo, 2.7—3 cm. lato; staminibus declinato-adscendentibus; stylo stammina longissima circiter aequanti; stigmate minuto.

Crinum Moorei x *Brunsvigia rosea* var. *minor*. Bulb relatively small; leaves lanceolate, 5.8—8.5 dm. long, 4.2—4.8 cm. wide at the middle; peduncle flattened with rounded edges, 54 cm. tall; umbel 18-flowered; spathe 2-valved, about 10 cm. long; pedicels 2.5—6 cm. long; ovary 1.5 cm. long; flowers pink; tepaltube 4—4.8 cm. long, 2.7—3 cm. wide; stamens declinate ascending; style about as long as the longest stamens; stigma minute. Type: nos. 133, 134, 138 & 139 in the Traub Herbarium.—*Hamilton P. Traub*

HYBRID AMARYLLIS CLONES

Introduced by Mrs. Mary G. Henry, Gladwyne, Penna.

xAmaryllis gladwynensis clone MARY DAVIS, M. G. Henry, **cl. nov.** This is the type plant of this hybrid described and illustrated in PLANT LIFE 7: 118—121, plate 18, right. 1951. It is the first clone of the hybrid to be named, and is named in honor of Mrs. Mary Davis, daughter of Mrs. Mary G. Henry.

xAmaryllis henryae clone ELIZABETH TRAUB, M. G. Henry, **cl. nov.** This is the type plant of this outstanding hybrid described and illustrated in PLANT LIFE 7: 117—118, fig. 22. 1951. This clone is named in memory of the late Mrs. Elizabeth Graf Traub, mother of Dr. Hamilton P. Traub.

HYBRID HEMEROCALLIS CLONES

TRIAL GARDENS. Cooperative daylily trial gardens have been established at (1) *Cornell University, Dept. of Floriculture, Ithaca, N. Y.*; (2) *University of Florida, Dept. of Horticulture, Gainesville, Fla.*; (3) *Southwestern Louisiana Institute, Dept. of Horticulture, Lafayette, La.*; (4) *Whitnall Park Arboretum, Milwaukee City and County Park Board, Milwaukee, Wisc.*; (5) *Texas A & M College, Dept. of Horticulture, College Station, Texas*; (6) *Des Moines Park Board, Des Moines, Iowa*; (7) *Los Angeles Arboretum, Arcadia, Calif.* [Complete addresses are given under *Officers and Committees, below.*]

Introducers should send complete collection of hybrids to these cooperating agencies in order that the new daylily clones may be impartially evaluated.

THE AMERICAN PLANT LIFE SOCIETY numbers the clones known to be published, including those registered and not registered, in various publication media. It is thus an easy matter to report the approximate number of named clones as of any date. Beginning in 1953, such a report will be made as of July 1 in each year.

Introduced by Stanley E. Saxton, Saxton Gardens, Saratoga Springs, N. Y.

DAMASCUS. A trumpet shaped flower of pale buff lightly flushed and veined in peach and pink tones. Well branched with 30 to 35 buds. Blooms late on 45" stems [3503-R].

KARISTA. Large, very wide petaled flower, with a ground of golden yellow heavily flushed red like a ripe peach. Well branched 30" stem. Early midseason. [3504-R].

MEDALLION. Large open, flat faced flower of Tangerine Orange (RHS 9) with veins and throat flush of Light Indian Orange (RHS 713-1). Overlapping petsegs 2" wide, sepsegs 1¼" wide. Stem 36". Early mid-season. [3505-R].

SYLVAN. A regular recurved medium large flower of Rose pink. The sepals are a shade lighter than the petals which have a milk white midrib. Small canary yellow throat. A smooth flower with a satiny finish. Blooms late on 38" stems. [3506-R].

WILL SCARLETT. Medium large flower of scarlet red. Form regular, segments somewhat recurved. There is a small golden throat. Stems 30", late midseason. [3507-R].

Introduced by Dr. J. B. S. Norton, Hyattsville, Md.

FORERUNNER. 20 inches high, very early, light yellow, segments tapering, inflorescence much branched for so early a clone. [3508-R].

GREAT LIGHT. 45 inches high, midseason to late, large pale yellow flowers open from late afternoon for 18 to 20 hours. [3509-R].

QUEEN MARJORIE. 30 inches high, early midseason, outer segments yellow, inner ones dark violet red; a large early bicolor with pronounced color contrast. [3510-R].

PURE GOLD. 35 inches high, early midseason, late to very late, clear yellow, wide segments, extended bloom. [3511-R].

WINEMAKER. 28 inches high, very late, dark violet red, full flower segments margins fluted. [3512-R].

Introduced by Ida L. M. McClure, Williamsville, N. Y.

CARESS. A very light yellow, cup shaped flower, with outer half of petals deeply washed with rose-beige on the upper surface; sepals almost untouched with color; 30-inch scape; 3½-inch flower; flowers on short branches along the scape; neat foliage. Mid July. An attractive flower, well worth protection from mid-day heat. [3513-R].

PINK CHIFFON. [PINK ANGEL x SU-LIN]. Drooping frilled petals; sepals standing upright; very pale pink; scape to 36 inches; flower 4½ inches; well budded. [3514-R].

RHODA LEE. A blend of three good reds; scape 30 inches; flower 4 inches; late mid-season. [3515-R].

NIGHT BIRD. Light yellow; flower horizontal, has the longest tube of any flower I have yet seen; has the effect of a bird perched on the plant. *A. citrina* hybrid; blooming in the evening but lasting well into the afternoon of next day. It carries the light fragrance of *citrina*; scape four inches; mid-season. [3516-R].

Introduced by J. C. Stevens, Greenville, N. Y.

PINK DAMASK. 36"; midseason; Jasper Pink (Ridgway), 5" self colored bloom, moderately branched, sturdy scapes having 12-15 buds; deciduous dark green foliage; July 15—Aug. 10. [3517-R].

Introduced by Ralph W. Wheeler, Winter Park, Florida.

STAR OF EVE. 42"; ER; YL1. Pale yellow star shaped night bloomer. An evening flowering daylily in the form of a six-pointed star. Sepals and petals are wide the sepals being folded lengthwise or rolled

and the petals somewhat pinched. The flower is large opens with a flat face both sepals and petals being pointed. The color is very light lemon yellow. Stems are 42". Growth is vigorous and flowering stems are numerous. Semi-deciduous in Florida and usually remontan. [3519-R].

AMARYLLID GENERA AND SPECIES

HAROLD N. MOLDENKE

[IN THIS DEPARTMENT THE DESCRIPTIONS OF AMARYLLID GENERA AND SPECIES, PARTICULARLY RECENT ONES, TRANSLATED FROM FOREIGN LANGUAGES, WILL BE PUBLISHED SO THAT THESE WILL BE AVAILABLE FOR USE BY THE READERS.]

DIPHALANGIUM S. Schauer, *Linnaea* 19: 702—703. 1847. Perianth corolla-like, salver-shaped, regular, marescent, the tube cylindric, subventricose at the middle, 6-costate, the limbs 6-parted, the segments (ligulate?) spreading, almost equal, longer than the tube, 1-nerved, callous-thickened at the apex; stamens 6, inserted in 2 series, diadelphous, evidently ternate, coherent at the base; filaments adnate to the tube, very short or even practically absent; anthers bilocular, introrse, linear-oblong, basifixed on the back; ovary ovate-pyramidal, 3-lobed, 3-celled; ovules very many; style continuous, erect, long, sulcate, thickened at the apex; stigma trigonous, dilated; *capsule connate with the perianth-tube from the base to the middle*, 3-sided, 3-celled, many-seeded. Close to the genus *Milla* Cav. and to be placed between this and *Tristagma* Poepp.

Diphalangium graminifolium S. Schauer, *Linnaea* 19: 703. 1847. Type, Aschenborn 30, from Mexico. Bulb-tuber almost round, the fibers of the dark tunic linear, parallel; leaves filiform, canaliculate, incurved-patulous, almost equaling the scape; scape simple, scarcely half an inch long, terete, bearing at the base a pair of opposite, small, membranous, very thin acuminate leaflets, otherwise completely naked, terminated by the flower; perianth white (?), the segments an inch long, containing a thick midrib, otherwise very thin, the tube continuous with the peduncle (that is, the upper part of the scape), half inch long, the ribs herbaceous, the intervening portions membranous; anthers white, exserted to the sinuses of the perianth; style almost half as long as the limb of the perianth.

Haemanthus mildbraedii Perk., *Wiss. ergeb. deut. zentr. afr.-exped.* 1907-1908. 2: 64. 1910. Bulb globose, about 1.5 cm. in diameter; leaves 2, contemporaneous with the flowers, oblong, short-acuminate, membranous, 13—14 cm. long, 6—7 cm. wide; petiole 17—18 cm. long, slender, surrounded at the base by a tubular sheath which is 7 cm. long

and purple-spotted; scape lateral, slender, 23—24 cm. long, 2 mm. wide, cylindric; flowers red (according to Mildbraed), arranged in about 12—14 flowered umbels; valves of the spathe narrowly lanceolate, before withering, acute; pedicel 1—1.7 cm. long; tube cylindric, short, about $\frac{1}{3}$ shorter than the segments of the perigonium, the segments linear or lanceolate, 16 mm. long, 1.5 mm. wide, acute, reflexed; filaments 22 mm. long, filiform, about half again as long as or twice as long as the segments of the perigonium; anthers ovate, scarcely equaling 2 mm. in length; style filiform, slightly shorter than the filaments. Central Africa.

Haemanthus andrei De Wild., in Ann. Mus. Congo ser. 5(3): 173. 1910. Bulbous; scape erect, red-spotted, about 20 cm. long and 7 mm. wide; umbel globular, about 10 cm. wide; bracts lanceolate, broken into pieces 4 mm. long; flowers pedicellate, the pedicel about 2 cm. long; segments of the perigonium linear, 3-nerved, about 11 mm. long and 1 mm. wide; filaments filiform, about 15 mm. long, accrescent; anthers about 1.5 mm. long.

Haemanthus seretii De Wild., in Ann. Mus. Congo ser. 5 (3): 173. 1910. Leaves distichous about 6, the blade short, cuspidate, oblong, about 30 cm. long and 12 cm. wide, the lateral nerves about 12, the transverse nerves oblique; scape red-spotted, about 27 cm. long and 2 cm. wide; umbel many-flowered, 12—15 cm. wide, subglobose; bracts lanceolate, broken into pieces more than 6 cm. long; flowers pedicellate, the pedicel with the ovary 30—35 mm. long; segments of the perigonium subacute 1-nerved, narrow, 21—25 mm. long, about 0.5 mm. wide, velvety at the apex; filaments red, 22—28 mm. long; anthers about 2 mm. long.

Paramongaia Velarde, in Lilloa 17: 489. 1949. Related to *Pamianthe* Stapf, but distinguished because the free portion of the filaments has its origin below the mouth of the staminal corona and mostly because the tube of the perigonium has the same thickness throughout its length and the style is completely free without sheet-like expansions. But in *Pamianthe* the tube of the perigonium has extremely thick walls in its lower portion while the cavity diminishes into the very narrow canal located in the middle. Moreover, the style possesses on its lower portion 3 sheet-like expansions by which it is united to the sides of the perigonal tube. From *Leptochiton* Sealy and *Hymenocallis* Salisb. it is distinguished especially because these have seeds which are of the same form as in *Pamianthe*, manifestly flat and winged.

Sprekelia spectabilis Hoehne, Arquiv. Bot. S. Paulo, vol. 1. fasc. 1. 1938, pp. 23—24. Growing in level fields, with the bulb entirely immersed in the wet soil; bulb tunicated, the coats diaphanous, becoming almost purplish, attenuate toward the apex, almost obpyriform, usually 5—12 cm. long and 6—8 cm. thick; leaves 3—6, distichous, lorate-linear, rather obtuse at the apex, imbricate below, flat, 30—60 cm. long and 2—4 cm. wide; scape erect, cylindric, very slightly compressed below, glabrous and green, rather terete above and becoming more or less pur-

plish, 40—60 cm. tall, the apex hidden by the binary spathe and many linear-lanceolate membranous bracts, 4—8-flowered; spathe 2-parted, membranous, triangular-lanceolate, 5—7 cm. long; bracts linear-lanceolate, acuminate, as long as the pedicel; pedicels rather terete, 3—4 cm. long; ovary trigonous, glabrous, 1 cm. long, the lobes rounded; ovules many in each cell; perigonium intensely purple-blood red, conspicuously greenish and fleshy below, 1 cm. long, tubularly connate, finally thickened and bearing a membranous lacerated corona at the throat among the filaments; tepals lanceolate, acuminate, conspicuously divaricate, more or less twisted, *the upper one* greatly recurved, 9—11 cm. long and 1.3 cm. wide at the middle, *the lower ones* convolute between the bases of the petals and enfolding the staminal filaments, arcuately incurved and almost falcate above; petals dimorphous, the lateral ones larger, slightly shorter and narrower than the dorsal sepal, the lowest considerably shorter and much narrower, somewhat distinct beneath the stamens; stamens 6, extending downwardly at the apex; filaments purple-blood red, quite a bit longer than the sepals; anthers linear-oblong, versatile, becoming purplish, 6 mm. long; pistil long-exserted; stigma deeply 3-parted, the lobes almost clavate, papillose on the inner face; fruit not seen. Material examined: Herb. Servico de Botânica e Agronomia São Paulo no. 36534, collected by F. C. Hoehne and A. Gehrt at Fazenda da Guanabara, Ilha Sêca, São Paulo, Brazil, half way to the boundary of southern Mattogrosso, collected in the living state in August, 1936, and blooming on October 21 of the same year in the Jardim Botânico at São Paulo.

Haemanthus faximperi Cufod., Acad. D'Ital. 1939, p. 326. Bulb ovoid, about 5 cm. thick; leaves 5—8, all basal or slightly superposed, the lowest ones almost reduced to the sheath, erect, obovate-lanceolate, gradually attenuate and sheathing toward the base, rounded or almost emarginate at the apex and protracted into a very small, obtuse, deltoid acumen, thin, glabrous, with 20—24 nerves which are more densely crowded toward the margins and joined together by many branchings, about 30 cm. long, 8 cm. wide above the middle; flowering scape growing out of the leaves, 1.5 cm. thick and 30 cm. tall, glabrous, naked, or with one or two lanceolate-acuminate bracts on the upper part which are 3—5 (rarely to 10) cm. long; inflorescence many-flowered, very dense, to 10 cm. in diameter; bracts many, green, erect, obtuse, 4—6 cm. long, forming an involucre; pedicels to 2 cm. long; tube of the perigonium 2 cm. long, 2—3 mm. in diameter, the segments linear, erect, 2 cm. long, 1.5—2 mm. wide, obtuse at the apex; filaments of the stamens inserted at the throat, to 2.2 cm. long, slightly surpassing the segments; anthers oblong, 4 mm. long, scarcely 2 mm. wide; style filiform, surpassing all the segments; all the parts of the flower, except the yellow anthers, intensely red-orange; fruit scarcely elongate on the pedicel, baccate, pea-shaped, red. In grass wet pastures in neighborhood of wells, 1600 m. altitude, April 8, 1937, Arero (Meta Gafersa), no. 278.

3. GENETICS AND BREEDING

FRAGRANT ALSTROEMERIA HYBRIDS

MULFORD B. FOSTER, *Florida*

After seven years of hybridizing alstroemerias I feel like the field naturalist who is always chasing butterflies but never stops to classify or mount any of his specimens.

I hardly know where to begin to enumerate the beautiful hybrids. The first one produced, *A. caryophyllaea* x *A. pulchella* L. f., was pictured and described in Plate 13, page 84, HERBERTIA EDITION, PLANT LIFE, vol. 6. 1950. In the present issue Dr. Traub has named it *xAlstroemeria racinae*, for my wife, Mrs. Racine Foster. The cover design of the present issue is based on *xAlstroemeria racinae*. *A. caryophyllaea* has been crossed with *A. inodora* and its variety, *nemorosa*, and also with an unnamed species which I found in Bahia in 1948.

One most pleasing and interesting feature about all these hybrids is that they have, without exception, some of the delightful perfume of *A. caryophyllaea* which is the only species I know of with a really delightful fragrance. This fragrance lasts for days after the flowers are cut, even until the last petal falls. [See Figure 135, page 45, HERBERTIA, Vol. 12. 1945.]

When Jacquin described *A. caryophyllaea* nearly a century and a half ago he gave it its species name because it reminded him of the carnation, *Dianthus caryophyllus* Lem. Linnaeus had previously named the clove tree *Carryophyllus aromaticus* because of its strong perfume.

Someday I feel certain that the lovely scented, cool night air of a Florida garden will make the alstroemerias as famous in poem and prose as do the odors from the ubiquitous orange, the tantalizing jasmine or the savory tea-olive blossoms.

My prophecy is that it will take several years before these lovely flowers become popular, if for no other reason than their name. It is a bit difficult to pronounce and remember by most people. Violet, rose, pink or orchid attached to its name would have insured immediate and widespread recognition. [EDITORIAL NOTE.—The popular name, PERUVIAN LILIES, for alstroemerias has been suggested and is coming into use.]

The color range is endless. The key of color is inclined to stay in the middle octaves. Their color notes are not pitched as high as they are in the Pacific Coast alstroemerias from Chile and Peru where they are inclined to be rather of the clear, red, yellow, pink, white or orange

tones. Brazilian alstroemerias carry a much more subtle range that is equalled by few plant groups.

With the introduction of the blood of *A. inodora* and its variety *nemorosa* we have increased the color range; we now find old-rose and lavender showing in some of the crosses, and while we would be perfectly thrilled to have some clear blue blood to work with, we can hardly expect it for none of our efforts to cross these Eastern species with the Western species have been successful.

Certainly there are few tropical perennials as easily cared for as these sweet scented hybrid alstroemerias. While they have thickened tubers on their roots they do not have to be dug and replanted each year. They ask for acid, well drained soil and a shady location. They are evergreen, transplant easily and do most of their flowering throughout the spring and early summer months and many of them carry on until their maternal parent *A. caryophyllaea* starts to flower in December through to March.

My new find from the 1948 collection in Bahia, Brasil is an alstroemeria that has a lovely drooping yellow and salmon colored flower. However, it is smaller and is not so "perk" as our *A. caryophyllaea* species is. The crossing with *caryophyllaea* does help it but we have yet to see just how much benefit we can obtain with its use. The plant is not too strong nor erect; the foliage is not as lovely. In contrast, the foliage of *A. caryophyllaea*, *A. pulchella* L. f., and *A. inodora* var. *nemorosa* is a real asset to the scented hybrids for their use as cut flowers. The leaves are nice for cutting, hold up well and add a decorative note with their green pin-wheel-like whirl of resupinate leaves.

In another year or so I hope to have some of the nicer selections ready for distribution.

xHEMEROCALLIS — GLADWYNE CHIMERA

MRS. MARY G. HENRY, *Pennsylvania*

Just two years ago in the 1950 HERBERTIA, I told the story of a new *xHemerocallis* clone which I am calling GLADWYNE CHIMERA.

I had tied a tag on the flower stalk that achieved the extraordinary feat of producing both red and yellow flowers on the same stalk in the summer of 1949. Unfortunately someone removed the tag. I was away from home the following autumn on a field trip and again on another trip the next spring, so it was not till early summer 1950 that I found time to divide the interesting new *xHemerocallis* clone.

I cut the clump with considerable trepidation, into six sections and replanted them carefully. The little "Trial Garden" was so overcrowded that I had to set out the 6 divisions in a row outside of the fence and I just hoped they would not be run over by the boy with the lawn mower



xHemerocallis—GLADWYNE CHIMERA; view showing whole plant: two flowers all red, and two flowers all yellow. Photo by Mrs. Mary G. Henry.

Plate 9

or have their tops chewed off by itinerant rabbits. That year only a few of the recently planted divisions bloomed and their stalks bore only red flowers. I did notice a few very small yellow streaks in some of the flowers, but these were inconspicuous and certainly added nothing to their appearance; in fact they detracted from their beauty, because they almost looked as though they were caused by an injury to the bud or else the result of an attack by thrips.

This spring, 1951, I left home in May in order to give a lecture in Montana. I added a collecting trip on to the lecture and had a thrilling time in the Bitterroot Mts., Mont., the Big Horn Mts., Wyo., and the Black Hills, S. D.

When I arrived home July 15. I was so utterly absorbed in preparing a place for, and planting rare *Penstemon*, *Phlox*, etc., that I completely forgot the *xHemerocallis*.

Then one evening after dinner, about 10 days later on, I slipped down to the "Trial Garden" to see if the seedling Azaleas needed any attention. Through the picket fence my wandering eyes caught a glint of yellow. Then I remembered the precious *xHemerocallis*.

There, as though a greeting, was one of the beautiful pure golden yellow blooms, more beautiful it seemed than ever. Evidently the division that had the yellow coloring did not bloom in 1950.

The two years' wait was forgotten.

It was about July 25th and although many blooms had come and faded, there were still many unopened buds. Early next morning, before breakfast, I tore down to the "Trial Garden," in keen anticipation of what I might find. No disappointment was in store for me. There were two gorgeous yellow blooms expanded, one on each of the two stalks and only one red one.

My camera records the story on the mornings that followed. Occasionally there would be a flower partially yellow but usually the metamorphosis was a complete one. Sometimes there would be two yellow flowers and one red and sometimes there were two red and one yellow. Several times there were two of each color in bloom simultaneously. [See Plates 9 and 10.]

It was such fun each morning to see what the day would bring forth. The blooming season ended about August 10th.

The nice part about all this is that the flowers are a fair size and the shape is good. The ruffling along the edges of the tepals adds to the decorative quality of the plant.

I would be ungrateful if I did not admit that my lucky star that has brought me so many beautiful and unusual plants is still shining brightly.



xHemerocallis—GLADWYNE CHIMERA; (See opposite page.) (upper left) two all red flowers; and two yellow and red flowers; (upper right) one all yellow flower, and one yellow and red flower; (lower left) one yellow and red flower; and (lower right) one all red, and one all yellow flower. Photo by Mrs. Mary G. Henry.

Plate 10.

PROGRESS IN DAYLILY BREEDING

W. R. BALLARD, *Maryland*

Anyone undertaking a breeding project with plants soon comes up against the problem of space, since the chances of securing an outstanding new variety are greatly enhanced by growing large numbers of seedlings. With experience in this field the proportion of promising seedlings can be increased. Knowledge of strains with good potentialities can be discovered, and efforts, based upon these discoveries, speed up progress. In the last two or three years, I have adopted a plan suggested by Dr. Hamilton P. Traub [HERBERTIA 1940, pages 152, 154.] designed to increase the prospect of variation in the resulting seedlings. This consists in the use of mixed pollen. With this method one can secure in one seed-pod many more combinations of characters than is possible by using pollen from a single individual. I have tried to use pollen from yellows on yellow, reds on red, pinks on pink, and bicolors on bicolor. It will be another year or two before the results of this method in the present case can be ascertained but it seems to have intriguing possibilities.

When beginning the breeding of daylilies I had no very well defined goal in mind except to get something different. I have at last concluded to concentrate on the late bloomers, since this group has not reached the development attained by the earlier groups. I do not plan, however, to give up entirely working with the other groups. One can secure interesting specimens for one's own garden even if they are not of sufficient merit for introduction to the public. One June bloomer has been striking enough to attract the attention of visitors to my garden. This has been named BIZARRE. It is a yellow "eyed" variety with the red color above the middle and on *all* segments which are over 4 inches in length. The plant grows about 2 feet high.

During the 1951 season I had a block of between 15,000 and 16,000 seedlings in bloom and some 200 or more selections were made before discarding the remainder. These will be made the basis of further crosses with each other and with standard named varieties. Expert daylily judges have indicated several in the late blooming group which merit naming and introduction. These will be further tested before distribution. These late blooming seedlings seem to hold considerable promise as breeding material for future improvement. Some progress has been made to increase the size of the flowers. Since the *H. multiflora* species which forms the basis for this project has flowers of only medium size, an attempt has been made to hold in storage pollen from the large flowering midseason bloomers for use on the late flowering sorts. It will no doubt take several generations to reach results comparable to what has been accomplished with the main season varieties, but the results to date have been encouraging.

One character has been studiously avoided in my work with the daylily and this is the spreading propensity of the EUROPA and similar types. For garden use this wandering tendency is a serious drawback. Fortunately most of the modern varieties "stay put" and this is certainly an ideal toward which all daylily breeders should strive.

xCRINODONNA CORSII CLONE DOROTHY HANNIBAL

L. S. HANNIBAL, *California*

This hybrid, *xCrinodonna corsii* clone DOROTHY HANNIBAL [described elsewhere in this issue] is one of several colorful seedlings resulting from the crossing of *Brunsvigia rosea* var. *rubra* with a *Crinum moorei* during the fall of 1941. The seed parent—*Brunsvigia rosea* var. *rubra*—is commonly called "variety minor" in California gardens. It differs from the better known "major" by its narrower foliage and late-flowering, near coral red, blossoms.

The *Crinum moorei* pollen parent would be hard to identify due to the variability that exists in this species. However, the clone was of a relatively small semi-summer-dormant bulb type that produces a small scape with nicely formed white blossoms. The *xCrinodonna* (syn.—*xAmarcrinum*) hybrid under discussion was the first of several score that have been hybridized. However, it is the hardiest of all to both drought and extreme frost.

The seed types that resulted from this initial cross will long be remembered as they were of two distinct forms. The most prevalent seeds in the pods of "rubra" were the relatively small coral red fleshy type so typical of *Brunsvigia rosea*. These, as often verified in subsequent crosses, were strictly parthenogenetic, but some 12 or 15 large opalescent green seeds were found in the pods of several scapes. These, which were relatively distinct from any known *Brunsvigia rosea* seeds, were about 10 or 12 mm., in diameter, and were germinating in the pod. Such behavior is typically *Crinum* and in habit *xCrinodonna* completely resembles a *Crinum*.

The bulbs of the clone DOROTHY HANNIBAL are seldom more than 2 inches in diameter which makes the hybrid a good pot plant. If freely watered the plant is practically evergreen and multiplies rapidly. It flowers with two scapes in the very late fall the blossoms being very fragrant and of a deep rose color. Unlike the much larger hybrid of Fred Howard, *xCrinodonna corsii* clone FRED HOWARD, this plant does not seem to attract the garden snails so readily, but mealybugs seem to be persistent pests.

Subsequent crossings have shown that only a few *Brunsvigia rosea* clones respond to *Crinum moorei* pollen. *Brunsvigia rosea* var. *major*,

which is the seed parent of Mr. Howard's well known hybrid will take *Crinum moorei* pollen occasionally. The pollen of "rubra" is more responsive. The variety *pallida*, the pale pink form crosses reluctantly, and clone FRANK LEACH has never produced a single hybrid seed.

The Australian *Brunsvigia multiflora alba* hybrids are equally unresponsive to *Crinum moorei*, and strangely enough do not produce many apogamic seeds either. In contrast to the behavior of *Brunsvigia rosea* several of the *C. moorei* clones and a half score of *Crinum* hybrids or related *Crinum* species have pollen nearly as potent as *C. moorei*, and when used on responsive *Brunsvigia rosea* clones will readily cross. However, in several instances difficulties were encountered with the hybrid seeds due to splitting by overly rapid growth. The reverse cross of *Brunsvigia rosea* pollen on a *Crinum* has never taken. It is quite probable that the stigma of the *Crinum* is much too long to permit *Brunsvigia rosea* pollen tubes to grow down to the ovary.

All in all, the clones of *xCrinodonna* are interesting hybrids since two distinct genera are involved with different growth habits and periodicities. That the *Crinum* dominates the cross so completely suggests that the respective chromosomes are not individually compatible. This is further borne out by the sterile habits of the hybrid, as it neither selfs or back crosses on either parent. Otto Staph commented in a similar vein (Curt. Bot. Mag. t. 9162) when he discussed the *Crinum*—*Brunsvigia rosea* relationship. However, this hybrid behavior merely indicates a common ancestry, like the *C. moorei* x *C. asiaticum* cross.

Reference: HERBERTIA, vol. 10, page 69. 1943.

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 35.]

in its pale-rose perianth being purple on the lower third (completely rose-red in *robusta*), the peduncle being rather thick, the spathe tubular up to the middle, the pedicel shorter than the spathe, the stamens scarcely reaching the middle of the limb. . . .

Eustephiopsis speciosa R. E. Fries, op. cit. 163. 1905.—Leaves narrowly linear, smooth at the margin; scape slender, about 2-flowered; bracts longer than the peduncle; segments of the infundibular corolla oblong or obovate, whitish-rose within, whitish and crimson-veined outside; teeth of the filaments slightly spreading, acute; anthers slightly exserted. Argentina.

Eustephiopsis latifolia R. E. Fries, op. cit. 164. 1905.—Leaves broadly linear, obtuse, white-margined, the margin scabrous; scape elevated, strong, longer than the leaves; inflorescence many-flowered, pseudo-umbellate; two exterior bracts narrow-lanceolate, the interior ones linear, all shorter than or subequaling the peduncle; segments of the tubular-infundibular corolla oblanceolate, red outside, yellowish within; teeth of the filaments rather obtuse, incurved; anthers and the

[Moldenke—AMARYLLID GENERA AND SPECIES, continued on page 183.]

4. AMARYLLID CULTURE

[REGIONAL ADAPTATION, SOILS, FERTILIZATION, IRRIGATION, USE
IN LANDSCAPE, DISEASE AND INSECT CONTROL, ETC.]

ADVANCES IN ALSTROEMERIA CULTURE

HARRY L. STINSON, *Washington*
Northwest Regional Vice-President

The Alstroemerias are slowly becoming better known and appreciated by the more alert and progressive horticulturists. Their ease of culture, freedom from pests and disease, and the long keeping qualities of the flowers at once make them favorites with those who grow them. More and more I receive inquiries from those who have seen them growing in some garden and wish to have a more intimate acquaintance with them. This past August I dug so many tubers that I thought that I never would be able to dispose of them all, but at this writing I am beginning to see the bottom of the barrel. In another couple of weeks it will be time to put them back into the ground for another cycle. With the coming of our rainy and damp season they start to show evidence of wanting to grow, and if not planted soon, they become a mass of tubers and rootlets difficult to separate.

The last two winters have been rather rugged. Ordinarily the hardy alstroemerias will survive light freezing. The tops will be frozen but they soon recover. However, this past winter we had a late freeze, without a protective covering of snow, which froze down to the tubers and killed out quite a large bed. A heavy mulch would have prevented this damage. Several growers in the North Atlantic States are successfully growing them by deep planting and heavy mulching during the severest part of the winter. Having overcome this problem the next one is to be able to keep the ground cool during hot summer days. Experience has shown that they do not like a soil that gets too dry and hot.

Digging the tubers for the trade is a tedious task and I have my doubts if a mechanical digger can be perfected to do the job satisfactorily. The tubers do not grow uniformly downward but in all directions of the compass, and while they are turgid they are extremely brittle. The slightest movement of the soil causes them to break, and they are more or less ruined for market. This past season I was digging eighteen inches deep and even at that depth I was constantly cutting off the ends of the tubers to such an extent that I doubt if they will recover. These mutilated tubers I saved separately and will plant to study the effect of such damage. I have discovered that when the tubers are planted

they immediately make root growth from the terminal ends of the tubers. Now, with the ends gone or damaged, will they send out more lateral rootlets to compensate for the loss of the terminal ones. Simultaneously with the root growth a new crown is formed adjacent to the old one or at the end of a stem-like structure which grows outward and downward to a length of two to four inches. Here the new crown is formed with a whole set of bigger and longer tubers. At the end of the season, the old set is completely absorbed and exhausted, just like an old potato. In the case of some species, year by year the tubers go deeper and deeper into the ground. I find that the tubers even penetrate down into the hard clay hardpan. This *story* was related to me by a good Garden Club Lady, and you well know that such ladies are not given to gross exaggeration. Like most Garden Club members they are always willing to share the good things of their gardens with fellow members. So when her friend asked for a start of the *alstroemerias* she readily consented to dig for her a few tubers. She was as good as her word and started to dig. She dug and dug and was half way across the street before she realized it, and still no tubers for her efforts. That possibly explains why they should be planted where they are to remain undisturbed for years to come. In digging them year after year I have noticed that the *A. ligtu* and *A. chilensis* and their hybrids do not have a tendency to spread by means of their tubers, which sink lower and deeper into the soil. On the other hand the tuberous system of *A. aurantiaca* [Fig. 13] and its relatives are more stoloniferous and do usurp the adjacent soil.

Notwithstanding their good keeping qualities as cut flowers the Florists' fraternity is still reluctant to use them extensively. It takes time and money to educate the general flower buying public. People are not inclined to buy those things which are not extensively advertised.

The two most outstanding events in the *Alstroemeria* world during the past decade were (a) Foster's re-discovery of the only known fragrant *Alstroemeria* species, *A. caryophyllaea*, [see Fig. 135, page 45, HERBERTIA, vol. 12, 1945], and (b) Goodspeed's re-discovery of Feuillée's *A. ligtu*, [see Fig. 136, page 49, HERBERTIA, vol. 12, 1945].

As to *A. caryophyllaea*, it is my understanding that it is very prolific under Florida conditions, and Mr. Foster has developed some very promising hybrids. Under my conditions here in the Northwest I have not been successful with them. Primarily I think due to insufficient warmth.

This species was originally brought to the attention of Linnaeus, junior, who classified it incorrectly as *A. ligtu*. Later, about 1774 (?), when Jacquin made an inventory of the plants in the Schoenbrunn Gardens, he wrote that he remembered it as having grown there about thirty years before but that it soon perished. He named it *A. caryophyllaea* because of its carnation fragrance. For a more complete account of this most beautiful flower consult the 1945 edition of HERBERTIA [pages 44 to 48, fig. 135].

Alstroemeria ligtu. Confusion in plant nomenclature is about as hard to live down as a bad reputation. Confusion about the *A. ligtu* of

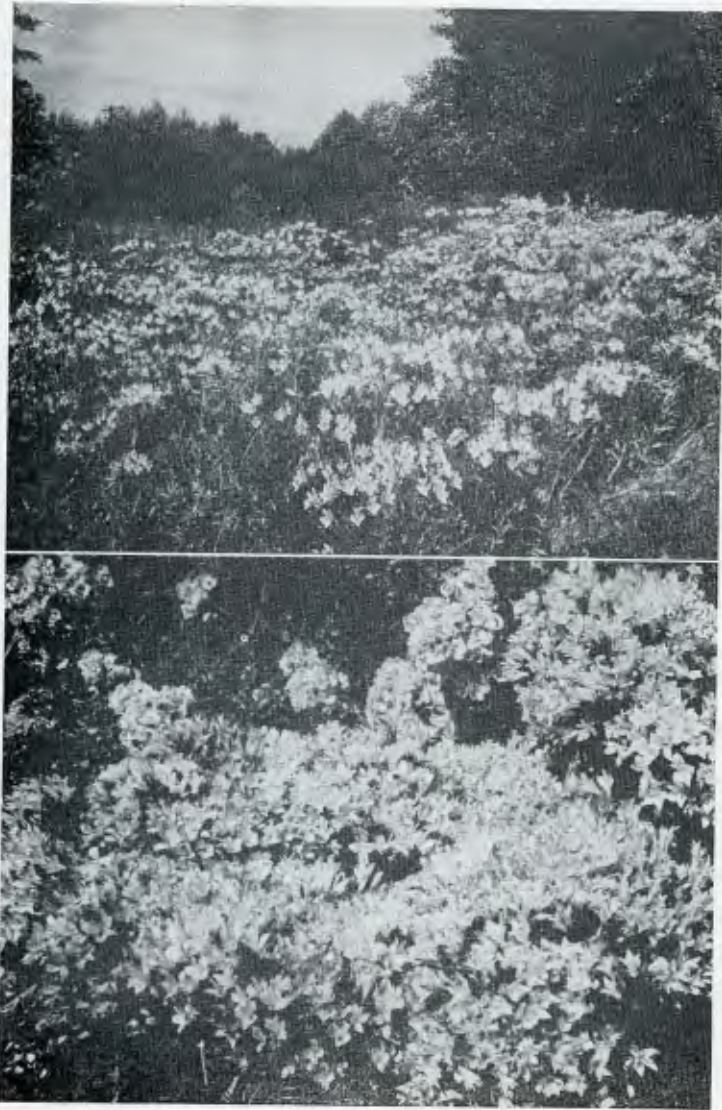
Father Feuillée dates back to the time of Linnaeus. Feuillée wrote that he found it growing on the banks of the river which flows through the City of Conception (Chile). There is no record of his having sent back tubers of it to France. Probably not, for it was still in bloom. He further states that he did not see the seeds as he had to leave before it was mature. Between the time when Feuillée found it, and the time of Linnaeus' *Species Plantarum* (1762) was published, another plant had been introduced into European gardens. This newcomer, Linnaeus im-



Fig. 13. *Alstroemeria aurantiaca*, the very beautiful species commonly grown in California. Photo L. S. Hannibal (Fig. 82, HERBERTIA, 1942.)

mediately perceived, did not coincide with Feuillée's description of *A. ligtu*. So much so that he wrote that Feuillée's description was so barbaric and poorly done that it was impossible to make it fit. From that time to the present day that plant has been parading as *A. ligtu* and its hybrids.

Since 1934, I have been collecting *Alstroemeria* seeds and tubers from all possible world wide sources in the hope of eventually finding a plant that would fulfill Feuillée's description. Out of thousands of plants scrutinized under cultivation under glass, only one plant (Plate



(Upper) One of Harry L. Stinson's fields of *Alstroemeria chilensis* in flower; (lower) Alstroemerias cut and placed in deep water before packing and shipping to the San Francisco World's Fair. Harry L. Stinson photo (plate 236, HERBERTIA, 1942).



(Upper left) Feuillée's *Alstroemeria ligtu*; (upper right) form in Stinson collection somewhat resembling *A. ligtu* (Feuillée's type); (lower left) a form in the trade as "*A. ligtu*," but may be *A. haemantha*; note leaves; (lower right) the beautiful pink form of *A. chilensis*. Photos by Harry L. Stinson (plate 226 HERBERTIA, 1942).



Alstroemerias naturalized at the University of California Botanic Gardens, Berkeley, Calif. Photo by L. S. Hannibal (plate 235, HERBERTIA, 1942).

12, upper left) ever gave any evidence that there might be a true *A. ligtu*. It was evidently a hybrid with some *A. ligtu* genes since it showed characteristics of both *A. ligtu* and *A. chilensis*.

By a stroke of good fortune seeds, derived from *Alstroemeria* plants collected by Dr. T. Harper Goodspeed of the University of California, during his Plant Hunting Expedition along the Andes (see Plate 13), came into my hands which proved that Feuillée was correct. Plants from these seeds definitely fitted his description of *A. ligtu* [see Fig. 136, page 49, HERBERTIA, vol. 12. 1945]. Nowhere in his description does he mention that there are cilia along the leaf margins. They are so evident on the species which we had been cultivating under the name of *ligtu* hybrids that Feuillée could not possibly have overlooked them if they had been present on his plant which he named *Ligtu*, after the flour meal made from the starch in the tubers. Neither do the Spanish botanists, Ruiz and Pavon, mention anything about the leaves having cilia. They write that this plant grows here and there in sandy places about the City of Concepcion (Chile) and abundantly in the adjacent Province of "Rere"—at that time a province immediately east or south of Concepcion and not given on modern maps. I am thoroughly convinced that Charles H. Curtis would find cilia on all the "A. Ligtu Hybrids" he so admirably describes in the March, 1951 issue of "Gardening Illustrated." Feuillée stated that his plant had *white* on the two upper petals. And it does. Further, Mr. Curtis writes that his hybrids of *A. ligtu* ? were marked with gold (yellow) and red on the two upper innermost petals.

The seeds of the true, *A. ligtu* are about one third the size of those of the *A. chilensis*. The stems are not as tall as the latter and have smaller umbels of flowers. Usually four to six peduncles with two, seldom three, pedicels. The flowers a clear crimson *with white on the two upper innermost petals*, with red markings. The tubers are much more uniform in size and shape than *A. chilensis*, usually about six tubers half an inch in diameter and four inches long. For several years I have noticed plants with tubers rather short and stubby, which I believe to be a characteristic inherited from the hybridizing of the *A. chilensis* with *A. ligtu*.

Experience has definitely proven to me that we now have the true *A. ligtu* of Father Feuillée, and that all that we had formerly been growing under the name of "*A. ligtu* and its Hybrids" are in reality *A. chilensis* and its various hybrids. Whether my viewpoint will be generally acceptable, only time will tell.

A. violacea [see Plate 170, page 23, HERBERTIA, vol. 7. 1940] is proving to be a favorite with all who see it. Its soft lilac-mauve is exceedingly pleasing, both as a specimen plant and for arranging. It does well in a cool humid house or well sheltered location free from all frosts.

The years of the past decade have been pleasant ones, horticulturally speaking, looking forward each season to the riot of color afforded by a field of Peruvian and Chilean lilies from the Andes [Plate 11]. It is my sincerest wish that the next decade will be as pleasurable to all those who indulge in the culture of the *Alstroemerias*.

ALSTROEMERIAS IN THE REGION OF ANGOL, CHILE

DILLMAN S. BULLOCK, *Chile*

Some of the very characteristic summer flowers of this part of Chile are the different species of *Alstroemeria* or as they are called here "Liuto." (Pronounced lēutō, u as in use.) "Liuto" is the indian name. The designation "Ligtu" is apparently a corruption of the indian name. It may be the name used by the indians of some other region.

They begin flowering fairly early in the spring, generally in October and continue until late in April. The period of flowering naturally depends somewhat on the season as well as the latitude and altitude.

The different species vary greatly in their time of flowering as well as in the length of time when flowers may be found. Our commonest species is probably *Alstroemeria aurantiaca*, the common yellow one. Under cultivation this species, in favored localities and with no special care, flowers to a limited extent almost every month of the year. In fields sown to wheat for the first time on recently cleared land it is a common sight to see the golden flowers mingled with the ripened grain at the harvest.

In this region we have at least six very distinct colors of flowers. Each species has its favorite environment where it is normally found and where it reaches its maximum natural development. Only occasionally are two species with different colors found flowering together. Frequently they may be found growing together but flowering at different periods.

There is also a very great difference in the height of the different species. The common yellow one normally grows from two to three feet high and in the grain fields is practically the same height as the grain. In the open fields on stony, uncultivated spots, one common species grows only about ten inches or a foot high.

The altitude variation of the different species is also very marked. The valley of Angol is only about 200 feet above sea level and four species are commonly found in the valley and surrounding hills up to perhaps 500 feet or a little higher. Another species flourishes in the coast range at 1500 to 2000 feet more or less. Possibly it has a wider distribution than this but the writer has observed it as abundant only at these elevations. Still another species is very common in the Nahuelbutts range of the coast high up among the Araucaria forests at around 4000 feet. These flower in the months of January and February.

In those localities where the *Alstroemerias* are naturally common they generally disappear as soon as the land is brought under regular cultivation. Along fence-rows, in rocky stony ground that cannot be cultivated and where they are protected from grazing, in certain years they may remain almost permanently. In some places along the railroad

right of way they seem to flourish exceptionally well. On the coast range in cutover land where the heavy timber has been removed and there is considerable second growth and brush, one almost orange species flowers abundantly in the months of February and March.

The *Alstroemerias* grow in a great variety of soils. In this part of Chile there is considerable rolling hilly land used principally for the growing of small grains and some grazing. In the late summer this land is almost entirely devoid of anything green. On these hills one pale-colored species, almost as spotted as a tiger lily, flourishes making use of the winter rains by flowering fairly early in the spring. It grows mostly besides the stones or on land so rocky that it cannot be cultivated. The soil is mostly heavy clay. Transferred to a rich well cultivated soil they all naturally grow better and larger. Under normal wild conditions I believe the soil is always acid where the *Alstroemerias* grow.

Naturally they all seed abundantly but not always. With some species there is no difficulty in collecting seeds every year but with others it is much more difficult. One species, at least, is very severely attacked by the larva of a moth which lives inside the seed pods leaving them entirely empty. In an attempt to obtain seeds of this species the writer collected a large number of plants just as the seed was ripening. Seventy-one per cent of the pods were attacked and entirely without seed. Several others had been attacked and had one or two seeds each. This natural enemy may account for the fact that species in some localities tend to die out and disappear without any apparent cause.

One practical use made of the different species is in the making of "Chuño." The "Chuño de Concepción" is quite famous. It is a kind of starch made principally from the enlarged roots of *A. ligtu* which grows very commonly in the region of Concepción. The common method of making the chuño is more or less as follows. After gathering a sufficient quantity of the roots they are carefully washed until *all* of the dirt is removed. When thoroughly cleaned they are placed in warm water for a short time to remove the bitter taste of the roots. They are then ground up and placed in cold water. After thoroughly mixing them with the water they are strained through a fine sieve to take out all the fiber. The starch is allowed to settle and later is thoroughly dried. This "chuño" is used principally as food for small children and persons suffering from digestive troubles.

Strange as it may seem, almost no one grows *Alstroemerias* in this part of Chile. Being a native plant it is rather looked down on by the Chileans themselves. It is the general feeling that things imported are much better than the native articles so why bother with them. This attitude accounts for the fact that many Chilean plants grown extensively as ornamentals in other countries are grown scarcely at all in Chile.

A TRY AT ALSTROEMERIAS

W. R. BALLARD, *Maryland*

I saw my first alstroemerias several years ago while visiting the U. S. Plant Introduction Gardens at Bell Station in the vicinity of Washington, D. C. I was impressed by the beauty of the flowers but it was not until the fall of 1948 that I ventured to try these interesting plants in my own garden. At that time I planted *Alstroemeria aurantiaca*, *A. hookeri*, *A. ligtu*, and *A. pulchella*. Of these only *A. aurantiaca* thrived and these have now bloomed for three seasons. In the summer of 1950 seeds were saved from these and were planted in a pit used for carrying plants over winter. The seeds germinated well the following spring and grew so well that the plants were transferred to the garden late in the summer.

In the fall of 1950 Dr. H. P. Traub was good enough to give me a plant of *A. pulchella* Linn. f. Plants of *A. chiliensis*, *A. pulchra*, *A. ligtu angustifolia*, and *A. ligtu* (true of Father Feuillée) were purchased. *A. chiliensis* grew well and flowered in 1951 but the others made weak growth and did not flower. This past fall plants of *A. caryophyllaea* were ordered and the blooming of this fragrant type will be looked forward to with eager anticipation.

I made one serious mistake this past season. The flowering stems of *A. aurantiaca* and *A. chiliensis* were supported by wire stakes 18" high. However, during early summer we had heavy rains and these alstroemerias grew three feet high and the stems were broken over by the heavy downpours. The crooked stems spoiled them for cutting but the flowers were as beautiful as ever. As noted by other writers the flowers have unusually good keeping qualities.

This fall some plants have been set in the open where they will get more sun than those previously grown and it will be interesting to see whether or not this will tend to restrict the height of the flowering stems.

ALSTROEMERIAS IN PENNSYLVANIA

JOHN F. RUCKMAN, *Pennsylvania*

In 1941 some six or seven varieties of *Alstroemeria* were sent to me from California for trial. There they had bloomed during the winter and arrived here late in April just as they were entering their dormant state. Though they were set out immediately, and every effort was made to encourage growth, they remained determinedly dormant all summer,

starting into growth just in time to be frozen back in the fall. A few of them survived the winter in a weakened condition but of the lot only *Alstroemeria aurantiaca major* was able to adjust itself to the point of blooming, and eventually becoming acclimated and established. It would seem that the only satisfactory way of starting Alstroemerias in the North is from seeds or with roots raised in a very similar climate.

I still have *A. aurantiaca* in several color phases, *A. aurantiaca major* and *A. pulchella* Linn. f. (syn.—*A. psittacina*) growing lushly in large mixed patches. All spread prolifically by rhizomes and to a lesser extent by self sown seeds. All bloom freely in June and July and intermittently until the first hard freeze. *Pulchella* is in bloom at present (October 22). Their only enemies seem to be poor drainage and occasionally field mice.

I understand that Mr. Rex D. Pearce grows *A. pelegrina* and possibly one or two others successfully at Merchantville, New Jersey. While only about thirty miles south east of Doylestown, where I am located, Merchantville is much nearer sea level and much nearer to the sea coast—consequently the winters are considerably milder there than they are here. I had intended to get plants from him to try here but so far have not done so.

ALSTROEMERIA VIOLACEA IN SOUTHERN CALIFORNIA

E. O. ORPET, *California*

We received 300 *Alstroemeria violacea* seeds from Dr. Goodspeed's expedition to Chile through the U.S.D.A., and although it was stated that the usual method of procedure required a year for their germination, we found that by soaking them until the white germinal spots showed on the seeds, they germinated almost at once and bore enough flowers in the first year so that we could at least see the color. Out of 300 seeds we got 350 plants, owing to the double embryos in some of the seeds. We sowed them in April. There seems to be no better way to propagate *Alstroemeria violacea* than by sowing seeds. The tubers cannot be transplanted until they are at least a year old and dormant, and even then they do not seem to take kindly to being moved. But there is no trouble at all with seed propagation.

The reader is referred to *Herbertia*, Vol. 7, 1940, page 23, Plate 170, for a good illustration of *Alstroemeria violacea*.

Alstroemeria violacea grows freely here at Santa Barbara, California, and reaches a height of about three feet when the roots are well established. Seeds are produced as freely on them as with any of the other species. We tried one hybridization experiment. There was a large clump of *A. pelegrina alba* growing next to the stand of *A. violacea*, and



Hybrid *Amaryllis* as grown by E. A. Wadewitz (center), of West Palm Beach Rd., Reswick, Adelaide, S. A.

Plate 14

we pollinated the *alba* on the *violacea* and vice versa, marking the pods, collecting them later, and sowing them. This was at least four years ago and we have kept that patch of seedlings separate. So far the flowers produced seem to be the typical *A. pelegrina*. The flowers are striking in size, and are hardy, but we are sure that anyone who is familiar with *Alstroemerias* would designate them as *A. pelegrina*.

Alstroemeria violacea is a true violet in color, according to the Ridgway Color Chart. It varies very little from opening to closing, although fresh stamens are bright blue, and that color goes off as the flower matures. They are hardy to our winters here, but they do not like wet feet and with prolonged and heavy winter rains they do suffer. They do best in light friable soil in part shade and on a slope. The tall ones must be staked, and since their stems are not so woody and long as other varieties, it is well to protect them from winds.

AMARYLLIS IN SOUTH AUSTRALIA

E. DOUGLAS, *South Australia*

Here in Adelaide in the southern part of Australia, Hybrid *Amaryllis* are usually grown in the open all the year round. Sometimes winter frost kills the leaves, but around December, we usually have 80°—90° F., weather. Between December to January, we can be sure of one week when the temperature rises to 100° F., and more. Hot winds come from the north (prairie) west, a flat country, 1000 miles wide with very few trees.

Within a 100-mile radius of Adelaide, 80 per cent of all Australian wine is produced; also celery, averaging a yard high, is a big business, much being sent to Melbourne and Sydney. Early tomatoes are also grown under thousands of low glass houses. Adelaide is situated between a range of low mountains and a gulf which is twenty miles west. Very fertile land produces almost everything—vegetables, and flowers, and especially, roses extra well. In the hills camellias, azaleas and rhododendrons grow well, and also fruits of all kinds—apples are much exported to Europe.

Mr. Wadewitz grows thousands of hybrid *Amaryllis* as a hobby [Plate 14], and has given away pints of seeds to growers Ron Kemp, Both, Ted Smith, who are growers and exhibitors of hybrid *Amaryllis*. Some marvelous gladiolus blooms are produced, and forced for exhibition purposes. Some of the blossoms seem as large as the open hand compared with the blooms produced out of doors.

AMARYLLIS NOTES, 1950

HERMON BROWN, *Chairman*
Amaryllis Committee, Gilroy, Calif.

This year [1950] started out with a hard freeze that killed a great many of my larger bulbs in the fields. Added to this handicap, it has been an exceptionally dry year. Fortunately, I have a good well, and could irrigate my bulbs whenever necessary.

However, we had three very hot spells that burned the leaves of the amaryllis. My prune orchard suffered more than the bulbs. Some of the prunes were actually burned up on the trees. Thus the growth of the fruit, and the growth of the amaryllis was checked, and therefore I have a much smaller number of marketable bulbs of 2½ inch size.

The unfortunate circumstances were somewhat alleviated by some much more beautiful blooms in my greenhouse—a number of new colors, mostly in shades of red. Heretofore I had a great number of orange-reds in various shapes; now I am getting a few in the crimson shades. I call them the "Blue-Reds." Have been short of pinks, but this year I had some very lovely pinks, and also some very satisfactory pink and white blooms.

Each year I bring in some new stock from Holland. While these imported bulbs have the color, shape and substance, they lack the vitality that my home grown bulbs usually have.

So far November has given us no frost to check the growth of amaryllis bulbs—hence no bulbs dug as yet.

The weather being so very dry, I irrigated the first of this month [November]. Then came heavy rains, six inches last week, but everybody is happy, as our wells had been going down about ten feet a year for the past three years. I am now lifting water over one hundred feet. If we continue to get good rains during the winter, the gravel beds will fill again, but we must store and conserve water.

"How long will Amaryllis seeds live?" is a question I am often asked. I have a small greenhouse that I keep heated just enough to prevent the plants from freezing and have found that the twentieth of January is a good time for planting the seeds harvested in the previous May, June and July. Have had fair success in raising a few thousand plants each year. It was May 23rd when I planted this year. I had also some seeds left from the year before, which were nearly two years old. These I planted in a flat by themselves, and they germinated about the same as those of a year old.

PERSONAL EVALUATION OF SOME HYBRID AMARYLLIS
CLONES*

ROBERT G. THORNBURGH, *Vice-Chairman*
Amaryllis Committee, Long Beach, Calif.

As far as amaryllids go, my first and foremost loves are the hybrid *Amaryllis* clones. The rest of them are of interest because they belong to the same plant family. I must admit that of these I am inordinately fond of the clivias. I am greatly intrigued by crinums but can't go overboard for all of them. I have tried to increase my collection of the last named with great help and encouragement from my wife, Edith. Many of the lesser kinds I have picked up as I went along out of mere curiosity. I have struggled along with vallotas, and got one of them to start a bloom, but it blasted. The other died back and I thought one of Edith's Narcissus flies paid it a call, but it is up again this month.

The following hybrid *Amaryllis* clones have been tested, and they are rated for performance.

DORIS LILLIAN (Ludwig). AA, this is outstanding. Looks magenta but is Tyrian Rose (RHS Color Chart), but at the time I had only the first volume which did not show the depth of rich color of the flower. It is 7 inches across, very clear deep pink, darkening in the throat with no green or other adulterant color; flat (*Leopoldii*) type bloom with even edges; no ruffles (Edith likes this kind). The petals do not recurve or lose any of the effect of a large flower, and thus gives the appearance of a larger bloom.

PINK PERFECTION (Ludwig). AA, 7½ inch. Same shape as above; Rose Madder (RHS 23/1) on edge and RHS 23 in the middle, and even darker in the center; *Leopoldii* flat stiff form. I do not mean that the bloom loses grace by "stiffness."

SWEET SEVENTEEN (Warmenhoven). 8 inch, salmon pink; rather light pastel with white stripes in center and white on back of petals. Edith likes this one. I also received from John Dix of Heemstede, Holland, two bulbs labeled "Rose." One of these is identical with SWEET SEVENTEEN, but the other is a clearer and better color. I did not grade these or the SWEET SEVENTEEN because I was prejudiced against the color. They would rate an A but on my list a B plus.

ROSELIND. (Ludwig). RHS Geranium Lake 20/2; small flower but a real pink, not salmon pink. At first I was annoyed that this was propagated but when I realized what a nice pink it was, rather delicate with much green in center, I liked it better. Somehow the green does not

*The reader is referred to HERBERTIA 1950 (in Vol. 6. PLANT LIFE. 1950) page 42, for a plate showing eight different flower types (shapes). Discussions on the readers' preferences for the various hybrid *Amaryllis* flower types is invited.—*Editor*.

detract from the whole effect. If you can put aside your prejudice against green, this is very pretty. Although it is small, it made up for that with 8 blossoms on two simultaneous stems, very showy and graceful. I did not grade this one since it is a novelty and either you like it or you don't.

JAVA (W. E. Rice). Petals not wide, yet neither narrow; Crimson RHS 21, with white center; a little green at base of petals. This year it bloomed only at 5 inches across, on a very small bulb, but two years ago had much larger blooms which I did not measure. I asked Mr. Rice why he chose this to name, and the reason was because he and his wife felt that the color resembled that of the American Beauty rose. I did not verify this since I had not seen that rose recently. I graded this one B on the basis of form, and also because I have much better flowers of identical design and color. It is a good flower but has been improved on since it was named.

LUDWIG'S SCARLETT (Ludwig). AA, the best of the Ludwig reds that I have.

AMERICAN EXPRESS (Ludwig). AA, very clear, brilliant flower, "medium red blending to deep red in throat." The bulb was not well rooted so the bloom was about 6½ inches. In the Cleveland trials it was graded AA, but I think that it was after they had the bulb more than one season.

SCARLET LEADER (Ludwig). Grade B blooms, small and adulterated with a dirty yellow-green in throat; petals not wide. One redeeming feature was that all blooms pointed or angled up about 30 to 40 degrees. This is a point that grades the bulb up with the commercial growers, who deal in fancy grades. They do not care for drooping blooms. The thing about drooping blooms is that some are so very good that one cannot resist them.

ERNEST LUDWIG (Ludwig). A minus; large clear scarlet with only the faintest yellow streaks to be seen in center when closely inspected.

LADY HELEN (W. E. Rice). Grade B on the basis of form; petals a little narrow, but this does not hurt it. It would be outstanding if the form were better; the color is excellent. A good clone to be used as a pollen parent; RHS Mandarin Red 17; a self with deeper throat, all of the utmost brilliance. It was named several years ago for Mr. Rice's wife.

DARK RED BONNET (Commack-Meade). Very clear red and deeper in center; velvety appearing texture; very small but quite graceful and attractive. This is the only Meade strain clone that I have seen and consider good.

RED GLORY (Meade Strain). A dull dark red with flecks of lighter white or yellow in center on closer inspection. Hardly worth naming as a clone; small poor form, Grade C minus. This did not bloom for me this year for the reason that it is the only *Amaryllis* bulb that died last December although it received the same treatment as the rest. It was not as hardy here in California as indicated for Meade strain stock in Florida. Perhaps it prefers acid peat soil.

A Van Tubergen scarlet grade B plus; clear scarlet with even, wide petals, 7 inches. The only bad feature was that the petals lacked enough body and became recurved as if the wind were blowing in its face. Another Van Tubergen scarlet did the same thing as to recurving petals. These were Signal Red RHS 719/1.

There are a number of Howard & Smith reds that are the equal of the Holland clones and several that surpass them in form and color. I can't resist describing one Howard & Smith pink. This, to me, is a true pink. It has taken me a long time to try to figure out what the growers and fanciers mean by "pink."* I do know that pinks are very scarce and bring higher prices, and the demand sets the price. This one is Geranium Lake RHS 20/2. This year it produced 8 inch blooms with very wide petals, but was more diamond shaped than rounded, but not pointed at the ends. It is somewhat tubular but still has plenty of face, and is very graceful. This was nearly all pink but with some white in center in the form of an abrupt short stripe in the center of each petal near the base. The white blended nicely on the back of the petals so that blooms also looked attractive from the back side. I graded this an A plus but would have made it a double A if it lacked green at the base of the petals. Again this green was not unattractive but, in my opinion, made it more handsome. In its own way I like this as much as I do the clone DORS LILIUM.

MAIDEN'S BLUSH (Commack-Meade). Grade D minus, and marked for discard. It is one that is so common, and may no doubt be duplicated when gathering the harvest of seedling bulbs. A Van Tubergen bulb labeled "pink" came out white with a fairly white greenish tint in center but a faint pink border all the way around the petals varying from a half to three quarters inch in width. Not solid, just sort of delicate. I did not expect this but being unusual, will keep it as a novelty. It has fair form, no stripes. The MAIDEN'S BLUSH made me think of it.

SALMON JOY (Ludwig). Grade A minus; 8½ inch, very flat clear dark salmon to orange, RHS Mandarin Red 17/2; very clear and nearly a uniform color, except at the base of the petals where there are two linear short yellowish pencil lines on each petal. A previous scape had 9 inch blooms, four to the stem; stems 20 inches tall; a third stem came up 6 inches tall, and had one 8½ inch bloom that had to face up. My wife and I belong to a dancing group which does nothing but round dances, all waltzes, formal dress. Being late in the camellia season, I could not find one to give her for a hair ornament. I asked her if she would like to try an *Amaryllis* and she agreed. So, I brought in one of these 9 inch blooms. Worn on one side of her head, it looked nearly as big as her own head, like something from Honolulu. She demurred and asked if I couldn't find something smaller. My rejoinder was that I had never, ever seen her back out on any kind of a hat however outlandish

*[EDITORIAL NOTE.—*Amaryllis belladonna* var. *Haywardii*, and some of the selections of *xAmaryllis henryae* and *xAmaryllis gladwynensis* are the clearest pink, Carmine, RHS 21, 21/1 and 21/2.]

or absurd and feel perfectly at home wherever she went. She replied, "OK, I'll take your dare." It made quite a hit at the dance and stood up or rather held up beautifully because this one is very sturdy. It lasted nearly a week after in a bowl. Everyone thought it was some sort of exotic hibiscus imported from where they knew not. In Life Magazine that week appeared an illustrated article on flower dresses, flower hats, flower jackets, etc., so that everyone thought that she had just kept herself up on the style of the week.

Van Tubergen "oranges," two bulbs, one a B plus, and the other a C plus. Again the recurved petals.

QUEEN'S PAGE (Warmenhoven). B plus; dull but clear orange, I suppose; petals recurved spoiling appearance. I mean by that that they over-do it. Some recurved petals do so in a manner that is graceful and pleasing, not as if some one put a curling iron on them.

Three Howard & Smith red picotees with white backgrounds and splashes of red in middle or center. In picotees a fine line of a different color completely encircles the outer edges. The form of these is not usually very good but I do not know why.

WHITE GIANT (Ludwig). Grade AA, 7½ inch bloom; very white but there is a little green at the base; broad, flat Leopoldii shape that stands up well.

BRIDESMAID. Grade A; 7 inch bloom, moderately green center.

SNOW QUEEN (Ludwig). Grade A plus; 7½ inch bloom.

NIVALIS. Grade B, on the basis of very small flowers. They come out in such profusion and are very white which makes up for small size. I thought this so attractive that I put it inside the house where it drew much comment from callers. Green is pronounced in the center but seems to relieve the white and make the flower more attractive.

ONE AMARYLLIS BULB'S FAMILY

CLARENCE LIONEL BUCK, *Maryland*

A former outstanding event in Washington, D. C., was the annual show of gorgeous *Amaryllis* in pots held each winter in the U. S. Department of Agriculture greenhouses, then located on Constitution Avenue, near 14th Street. When some years afterward I first encountered a bin full of *Amaryllis* bulbs for sale in a local seed store, it took scarcely a moment for me to become the proud owner of one.

After potting the bulb, and enduring a few impatient weeks of watchful waiting, I was rewarded by the appearance of two flower scapes, one of which bore four and the other five beautiful blooms. This delighted me and stimulated an interest in *Amaryllis* culture which has grown during the years.

The nine blooms faded and nine seed pods grew and matured several

hundred seeds. As I watched this development, I wondered what inherited characters might be present in these seeds. A reluctance to discard or destroy the offspring of such attractive flowers, plus my curiosity about what possible color variations might occur in the plants produced from these seeds, led to the planting of all the seeds in a large flower box. They germinated readily and green blades began to appear above ground in about three weeks, during the month of May.

The seedlings grew outside under the shade of a large tree during the next two summers and during the intervening two winters in the south and west bedroom windows. The third summer the bulbs, then about a half inch in diameter, were removed from the flower box and set out in the garden and some reached size and maturity to bloom the following winter.

About four hundred bulbs were harvested that autumn, the largest being about $1\frac{1}{2}$ inches in diameter. In the rush of digging and storing them on the afternoon and evening of the season's first freeze, about half of the bulbs in bushel baskets and cartons were placed in a tool shed and froze when the temperature unexpectedly dropped to 18° F.

The survivors were numbered as they bloomed and the color and quality of the blooms recorded. I believe the original bulb was of the Mead strain because of its narrow leaves. Of the sixty blooming seedling bulbs recorded to date, forty-four were red like the parent bulb, and nineteen were red and white combinations. Of the forty-four reds, two had a distinct orange shade, and one that bloomed in 1950 bore two flowers each having a somewhat imperfect double set of petals. Unfortunately no seeds were developed from them.

BLOSSOM RECORD

Number of Flowers	Color of Flowers:	
	Red	Red and White
4	4	0
3	11	3
2	29 (1 double; 1 with 2 scapes)	16
Total	44	19

I still have the original bulb potted and blooming each year although it has never equaled the record of nine flowers produced the first year.

Following the second summer, the bulbs were in the garden, a dozen of the larger ones averaging nearly three inches in diameter, were not dug. The winter was rather mild and the covering of cornstalks, leaves and an old rug protected the bulbs from freezing. However, their inclination to bloom must have been chilled because no flowers appeared the following season. They failed to survive the second and colder Maryland winter in the garden.

I now have a second set of seedling bulbs which represent five different hybridizations, which should bloom this coming season. A neighbor has a similar set of the same hybrids.

Twenty-five seeds of this same group, although two years old, were treated by soaking in 0.2 per cent solution of colchicine for 24 hours but failed to germinate.

AMARYLLIS CHILENSIS

HAMILTON P. TRAUB, *Maryland*

Several years ago an amaryllid was obtained from van Tubergen in Holland under the name, *Habranthus bagnoldii*. When the bulbs flow-

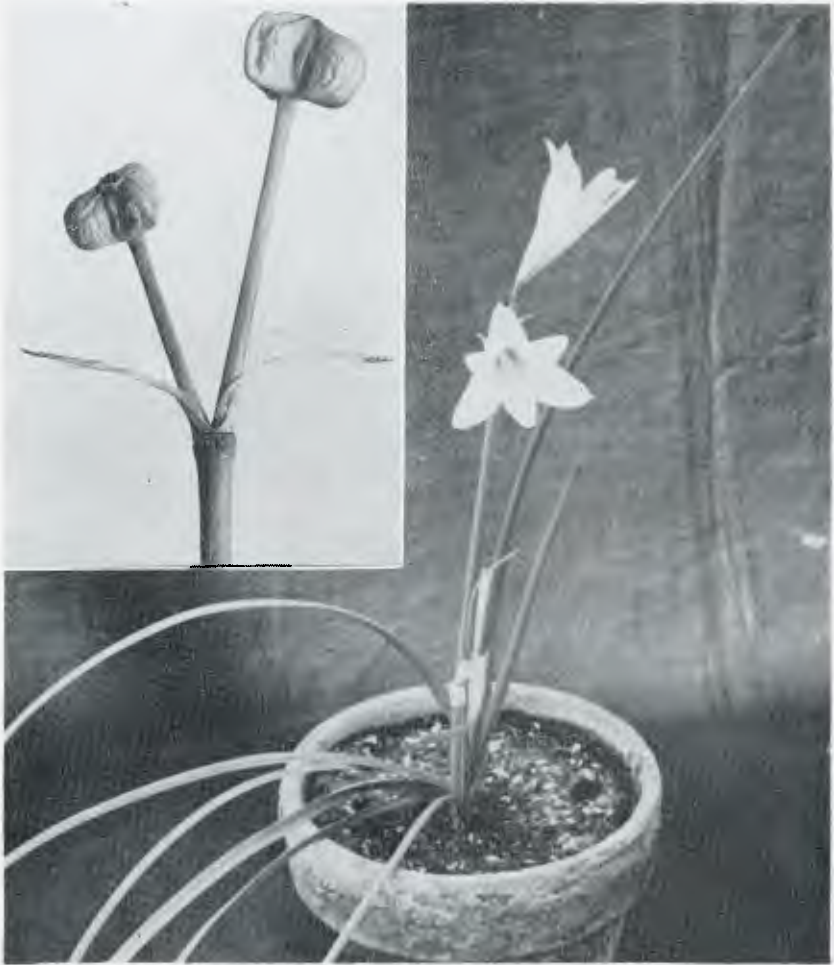


Fig. 14. *Amaryllis chilensis* L'Hérit.

ered it was at once apparent that they had been mis-labeled since the flowering plant fitted the description of the yellow form of *Amaryllis*

chilensis L'Herit. (Sert Angl. 11, 1788; descr. in Traub & Moldenke, Amaryllidaceae: Tribe Amaryllaeae. 1949, pages 95—96.).

It is a very beautiful pale-yellow-flowered form, the umbel being usually 2-flowered, rarely 1- or 3-flowered. It grows best in a soil mixture to which some ground oyster-shell has been added. It blooms for a long time, from June to late summer. The illustration [Fig. 14] shows one potted bulb in flower. It is best, however, to plant from 6 to 8 bulbs in a single pot so as to obtain the maximum display.

This form is self-fertile, and seedlings may be easily grown from seeds, provided they are grown in soil to which some ground oyster-shell has been added.

Amaryllis chilensis is native to sandy plains of South Chile, where bright red or yellow forms are reported to grow. It is hoped that new collections may be introduced from Chile so that a wider range of colors may be had in this choice subject.

This plant is represented in the Traub Herbarium by nos. 29 and 204, preserved from cultivated plants.

AMARYLLIDS AS GARDEN MATERIAL

WILLIAM LANIER HUNT, *North Carolina*

Miniature amaryllis, sternbergias and the red *Lycoris radiata* are the best of gardening material for an early fall effect. Only the *Lycoris radiata* have been in Southern gardens in large enough quantities, except in a few communities, to show what they could do until recent years. The writer has, through the years, accumulated several thousand of each. They are now planted in a fall bulb garden in the woods. As the bulbs increase, the garden is simply enlarged to accommodate them. The increase of *Lycoris radiata* is amazing. From a small area where less than a bushel were planted ten years ago, fifteen bushels were dug this summer. Since the bulbs had been planted in rows and spaced evenly apart, it was possible to count them and to estimate that one bulb had produced approximately thirty-five bulbs in the ten years they had been there. *Lycoris squamigera* had increased to one hundred twelve from twelve bulbs in ten years. The increase of *Amaryllis bifida* is considerably less, but sternbergias (*Sternbergia lutea*) are close runners up.

One of the chief landscape virtues of these three bulbs lies in the fact that they can be left undisturbed for about ten years if one plants them in reasonably good soil which has had a liberal dose of bone meal. Perhaps the miniature amaryllises can be left even longer in one place. Sternbergias and *Lycoris radiata* in the garden in question have been flowering profusely every single year for ten straight years. During the four war years, poison ivy, Virginia creeper and honeysuckle made a veritable jungle of the beds. When the vines were removed, the bulbs

were found to be in good condition—apparently none the worse for the experience. Since honeysuckle is evergreen in North Carolina, it seems incredible that the bulbs could have survived the winter shade while their foliage was on, but they did.

The winter foliage of all three of these bulbs is a thing of great beauty and landscape value. Where an evergreen ground cover is needed under deciduous trees, nothing is richer looking than the foliage of these bulbs planted about six inches apart over an area. Now that red *Lycoris radiata* at least, are cheap enough to be bought by amateur gardeners by the hundred and thousand, we can hope to see sights like that in the writer's garden where beds ten feet wide and over a hundred feet long are in full bloom in September and October, and then beautifully evergreen until June. Spring bulbs are interplanted in this composition to provide another flowering season when winter is gone. *Lycoris squamigera* has now been planted, also, throughout one bed for a mid-summer effect like that which Mr. Crippendorf pictured for us in one of the early numbers of HERBERTIA [Vol. 2. 1935, page 128]. As time goes on, still other amaryllids are increasing in this garden to the point where they will be used in vast quantities. The magnificent white flowers of the dramatic *Hymenocallis occidentalis* collected in the mountains of Tennessee and Alabama some years ago are soon to be interplanted in a moist bed.

Another notable virtue of sternbergias, *Lycoris radiata*, miniature amaryllises, and doubtless of other amaryllids, is the fact that they can be planted right under deciduous trees and maintained there. All the large beds described above are under trees. Some are under slippery elms and black locust, the roots of both of which are notorious for their shallow foraging habits. It is well to use a subsoiler in the initial preparation of beds under such trees and as close to the trees as feasible. The beds described above, however, were simply dug only one shovel deep. Some humus was added, a liberal dressing of bone meal, and then the bulbs were planted. Such plantings can be assisted, if need be, with a light dressing of complete fertilizer just as the leaves drop from the trees. The fact that the bulbs use it immediately before the tree roots can get it probably is a strong factor in helping the bulbs along. Inasmuch as sternbergias and *Lycoris radiata* have a way of increasing upwards in the soil so that they finally make almost one solid sheet of bulbs on the surface, an experiment will now be performed this year to see if some old undivided plantings now ten years old can be kept going with a light top dressing of rich soil and bone meal. Many of the bulbs on top cannot reach the soil with their roots until rainy weather comes, and just lie on top of the soil until the ones in the soil have long since flowered and put up their foliage.

SOME TEXAS AMARYLLIDS

THAD M. HOWARD, *Texas*

The *Amaryllidaceae* are represented in Texas by several important genera which are widely known and grown by amaryllis enthusiasts everywhere. On the other hand, a few of our species are so rare that only a privileged few have ever seen them. *Zephyranthes*, *Habranthus*, *Crinum*, *Hymenocallis*, *Nothoscordum*, and *Allium* are genera represented.

Perhaps the most widely seen but less generally appreciated amaryllids found in Texas are *Zephyranthes*, including the subgenus *Cooperia*, commonly known as "Rain Lilies." Until recently, *Z. brazosensis* and *Z. drummondii*, were the only known members of the subgenus *Cooperia* in Texas. The past few years have seen the welcome discovery of several rare new species and a consequent augmentation of color variation. Before these new species were discovered, the only color known to the subgenus *Cooperia* was white, but now yellow has been added to increase the color range of this genus.

Zephyranthes brazosensis (syn.—*Cooperia drummondii* Herb.) is the most common COOPERIA in Texas. Its fragrant white blossoms may be seen erupting in great profusion from lawns, vacant lots, pasture, and waste places by the thousands over a large portion of the state. They begin blooming in mid-summer and continue into early autumn, the length of their season depending on the amount of rainfall that they receive. After a heavy rain they seemingly sky-rocket out of barren ground overnight and burst into bloom. Although there is much variation among individuals of this species, the largest portion fall into two general types. The first type has a flat, star-shaped blossom which opens early in the evening and is spent by noon of the following day, the flowers turning pink with age. This type is the prettier. Its bulbs average 1 to 2 inches in diameter. The second type has taller scapes, larger bulbs, and slightly smaller flowers, and its blossoms open later in the evening and close earlier the next day. The broader flower segments do not open out flat but roll inward at the edges creating a slight cup-shaped effect.

Zephyranthes brazosensis is persistent in lawns and is not one to yield easily to the ravages of the lawn mower. It is a summer bloomer and winter grower; it is therefore seldom cut often enough to damage it severely. Its narrow grey-green leaves are conspicuous among the dead grass in winter.

Zephyranthes brazosensis takes kindly to cultivation but should not be drowned by impatient watering in the summer. As a matter of fact it cannot be as easily forced into bloom by the over-enthusiastic gardener as one might suspect. When the plant is under cultivation the writer has found that no amount of watering will hurry it into bloom until it "feels" that the proper time has arrived, generally August. It is then

that it makes its strong bid for attention. Although the individual flowers do not last long, the plants bloom several times during a season. Unlike their near relatives the members of the subgenus *Euzephyranthes*, those of the subgenus *Cooperia* possess long tubes, are fragrant, and bloom at night.

The Giant Rain Lily, *Zephyranthes drummondii* D. Don (syn.—*Cooperia pedunculata* Herb.) is larger in all its parts and is more widely cultivated than any other species of the subgenus *Cooperia*. It differs from *Zephyranthes brazosensis* in that it has a much larger bulb, and wide, blue-green, daffodil-like foliage. Although the flower scape is somewhat shorter (about 8 to 10 inches), the flower itself is almost twice as large as that of *Zephyranthes brazosensis*. Usually a late spring and early summer bloomer, it may occasionally be seen blooming in large plantings during the summer. This species is not as common as *Zephyranthes brazosensis* and is usually found growing in richer soil and where more moisture and shade are available. Like *Zephyranthes brazosensis*, it is a fall and winter grower and is drought resistant.

In addition to the species of the subgenus *Cooperia* already mentioned, two new yellow species—*Zephyranthes smallii* and *Z. jonesii*, and the rare white, *Z. traubii* have been discovered. The yellow color should be a welcome addition to collectors if and when enough stock of these interesting bulbs can be worked up to become available to collectors.

Habranthus andersonii var. *texanus* is another interesting little amaryllid native to our Southwest. It was formerly classed as a *Zephyranthes* but all botanists now agree that it is a true *Habranthus*. It is surrounded by much geographical mystery. How a plant native to Texas can have an identical counterpart growing thousands of miles to the south in Argentina is a wonder to many botanists. Nevertheless, *H. andersonii* grows naturally in South America and the variety *texanus* in Texas. Regardless of its ancestry, the variety *texanus* is a beautiful flower and a wonderful garden subject. Its interesting coloring and amaryllis-like form alone are enough endorsement to gardeners who have never grown it. It has a warm old-gold-colored interior and an exterior finely penciled with coppery-red lines which have given it the common name "Copper Lily." The throat has a small blotch of the same coppery color. There is some variation, however, in the amount of markings found in the different individuals of this species. For example, one individual in a planting of several hundred bulbs in the writer's garden stands out clearly as a distinct specimen. It has broad, rounded petals much like those of a fine amaryllis, and there is a brilliant maroon red blotch in the throat and richer interior and exterior coloring. An effort will be made to save the seeds of this one for propagation of the strain. The throat of some individuals is colored a deep maroon purple in a fashion similar to that of *H. brachyandrus*; others are without any markings in the throat and have very little exterior penciling.

Like the blossoms of other members of the rain lily tribe the flower of the variety *texanus* usually lasts but one day. The scapes range in height from 6 to 12 inches the flowers being about 1½" in diameter. Its

long blooming season and profusion of blooms, however, make it a "must" for the garden. In its native habitat its blooming period may extend from July to September, the length of its season depending on rainfall; but under cultivation it begins to bloom a month earlier. It is easily cultivated, requiring only a warm, sunny exposure and an alkaline soil. It is a fall and winter grower, becoming deciduous in the summer. If planted in large numbers, it may be had in bloom almost continuously throughout the summer. It is quick to respond to a heavy soaking from the garden hose and can be bloomed repeatedly in this manner. Although slow to form offsets, it sets seed freely and can be quickly reproduced from seeds. Though widespread in mesquite flats across the state, *Habranthus andersonii* var. *texanus* is rapidly disappearing in many localities, its former habitats having fallen to the farmer's plow. Its bulbs deserve to be more widely grown by gardeners and commercial growers, but the latter should build up their stocks from seed. Since most of the bulbs offered are collected in their native habitats, the supply may eventually become exhausted.

Among the subgenus *Euzephyranthes* of the genus *Zephyranthes* are found two yellow species, *Z. longifolia* and *Z. pulchella*, which grow in the western and southern parts of the state, respectively. Both are interesting additions to the garden.

The *Crinum* group is represented in Texas by one species, *Crinum americanum*. It extends as far west as southeast Texas. While it is not a common plant there, one may occasionally find it blooming in roadside ditches or along the banks of canals and bayous perhaps as far west as Houston. Unlike most *Crinums*, *C. americanum* is not a dependable garden subject since it requires a constant and adequate supply of moisture to maintain itself.

The genus *Hymenocallis* is represented in Eastern and Southeastern Texas by two species. The first, *Hymenocallis galvestonensis*, or Texas AMERINDIAN LILY, bloom along the coastal plains in the spring. It may be found growing inland as much as 100 miles from the coast in marshy river bottoms. It is a desirable AMERINDIAN LILY for the garden because it is usually in full bloom in early spring. The blooms are not as striking, however, as those of *H. occidentalis*, our other native species. *Hymenocallis occidentalis* is sometimes known as the western or inland AMERINDIAN LILY. It is unique in that it sends up its flower scape in mid summer after its foliage has disappeared. The large white flowers are extremely showy. *H. occidentalis* differs from *H. galvestonensis* in having glaucous-green foliage, larger, showier flowers, and a later blooming period, and also in losing its foliage before the flowers arrive. Being native to East Texas and Louisiana, it is widely grown by gardeners in that region.

The Alliums of Texas occur in numerous forms, but all of them are not well enough known to be correctly identified. *Allium coryi*, found in West Texas is our only yellow species and is quite rare. *A. nuttallii* (syn.—*A. helleri*) is widely spread throughout south central and west central Texas. Its pink flowers vary in shade from almost white to deep

rose-purple. It thrives in gravelly soil but will grow in nearly any kind. *Allium mobilense* (syn.—*A. mutabile*) is a white *Allium* growing slightly taller than *A. nuttallii* and having a denser flowered scape. *A. canadense* is similar in appearance to *A. mobilense* but grows taller, is more vigorous, and far less showy. It is characterized by bearing bulbils in the scape in the sparsely flowered umbel. Common throughout the state, it is usually found in moist places, especially along river banks. The identity of other species, some of them very beautiful, is not well known. Most of the alliums make excellent garden subjects, an exception being *A. canadense*, which will quickly become a nuisance. They are quite showy when used as edgings in flower borders.

The genus *Nothoscordum* is represented in Texas by a sole species—*Nothoscordum bivalve*. It is so common along railroad right-of-ways, in lawns, vacant lots, roadside ditches, and mesquite flats, that nearly everyone is familiar with it. *N. bivalve* is very similar in appearance to the *Alliums* but lacks the characteristic onion odor. In fact, the white or creamy star-shaped blossoms are very fragrant. It is strange that few people have ever noticed its fragrance; the species is so common that its good qualities have probably been overlooked. The lack of appreciation given to it can be shown by its common names—"False Garlic" and "Crow Poison."

The blossoms of *N. bivalve*, although not striking, are very pleasantly perfumed and are produced over a long period of time. They are unique in that they open at mid-day, close at night, and remain closed on cloudy or rainy days. Under cultivation, each bulb sends up scape after scape in a long succession until June or July, when it becomes dormant. Then dormancy is of short duration, however, as the plant has another blooming season in early autumn. Because this wildling is so prolific in reseeding itself, when admitted to the flower border, it is advisable to remove its flower stems as soon as the blossoms fade.

THE 1951 DAFFODIL SEASON

GRANT E. MITSCH, *Chairman*
Narcissus Committee, Canby, Oregon

While it is quite the normal trend to have flowers of one kind or another blooming through most of the winter here in the Willamette Valley, the last few winters had been unkind to precocious plants, but the 1950-1951 season came on auspiciously and gave us reason to believe that once again we would enjoy more normal weather. The moist congenial atmosphere encouraged early growth and I think we had never witnessed previously so much foliage and buds in January, many of the plants, particularly of seedlings not lifted for two years, being nearly twelve inches high by the end of the month. Polyanthus primroses had been blooming for weeks and summer blooming annuals were still alive, while *Anemone fulgens* was full of buds with a few open blooms, providing fiery brilliant cut flowers in mid-winter. *Narcissus asturiensis* (better known as *N. minimus*) opened January 8th. One could wish that this delightful elfin flower increased more readily.

This propitious weather was not destined to last, however, for on January 28th, a cold wind came in from the Northeast bringing a frigid air mass from across the Canadian border. As the wind increased in intensity, the temperature dropped, and for several days the storm continued, the biting drying wind combining with a seventeen degree thermometer reading. Although this was not excessively cold, the soft lush tissues of actively growing plants were first frozen and then dehydrated. Primrose growers lost thousands of plants, and thousands more which did not entirely succumb, lost their foliage and buds, and did not recuperate for the normal blooming season. Daffodils suffered a great deal more than in the previous colder winters, as growth was too far advanced and too soft to cope with such conditions. Veteran Daffodil growers witnessed for the first time the outright killing of foliage, and in a few cases, buds, on some varieties. Of course, most varieties were injured little, if any at all, and those sustaining most damage made a partial recovery by growth of that portion of the foliage not yet above ground when the freeze came. It was only a few of the varieties farthest advanced in growth that were affected; others quite as tall were unscathed. WHITELEY GEM suffered quite severely; MALVERN GOLD bloomed with many broken stems; and ROUGE lacked its usual brilliant color and was very deficient in substance. The cyclamineus hybrids, FEBRUARY GOLD and MARCH SUNSHINE seemed quite immune to the vagaries of the weather. TROUSSEAU bulbs received from California, and consequently earlier to grow than home grown stock, had buds nearly ready to open, and they suffered heavily, the soft succulent stems rotting off in some instances, and in others, the perianth opened to expose a blackened incompletely formed corona; still others developed quite good

flowers. BRUNSWICK, which is very consistently good, and one of the very early varieties, was somewhat lacking in quality. Even later blooming flowers such as BAHRAM which was so magnificent the year previous were lacking in substance after this ordeal. The foliage of SILVER CHIMES was almost completely blackened, but being only a few inches high when the freeze came, it made quite an amazing recovery, putting up a very creditable showing of flowers and producing large sound bulbs.

Following the severe storm, the weather was colder than previously, and while FEBRUARY GOLD, MITE, and a few others bloomed toward the end of February, we had few good outside blooms until near the end of March. The first week of that month produced heavy snow nearly every day but most of it would melt before the following day's fall. The low temperatures were perhaps fortunate as the frost damaged foliage might easily have become infected by foliage diseases had the moisture been combined with higher temperatures.

While inclement weather held sway in the garden, it was our privilege to enjoy some splendid blooms grown in pots. These were kept outside until nearly ready to bloom but protected from freezing. ROUGE came in good form and very early; perhaps not quite as highly colored as it normally grows in the open, but still a good flower and one coming before the other red cups. ZERO developed magnificent blooms, both from bulbs grown in a pot, and from those grown in the garden; its large size, great purity, and early blooming bringing it to the forefront. Never have we seen more magnificent blooms of CONTENT—it certainly should make a fine forcing flower. Its form, size, balance, and texture seem to leave nothing to be desired, and in addition it is a good keeper. More than that, we have found it one of the best for breeding. A pot of TRUTH with eight or nine fine large perfect immaculate blooms will be long remembered—a breathtaking group. These too kept in good condition a long time. Both TRUTH and CONTENT are excellent in the garden but still finer grown in pots.

Of all the varieties which were grown in pots, doubtless the favorite of all with our visitors was MABEL TAYLOR which produced larger blooms of better form than grown in the open, and the coloring was clearer pink with less of the orangy-salmon undertone although less brilliant. It shows great promise of becoming a splendid commercial variety when stocks become plentiful. One of the very late blooming pinks is ROSE OF TRALEE which came nicely potted, but being so late, and being one which could not be hurried, it opened but little before bulbs of it bloomed in the field. WILD ROSE remains about the clearest in color of the pinks although it varies much in intensity from year to year.

In general, we have not had too good results with red and yellow Daffodils grown in pots, but one of CHUNGKING gave superb blooms of perfect form and brilliant coloring, surpassing any we had seen previously. GREEN ISLAND produced perfect circular flowers of exquisite finish and enchanting coloring, and we are coming to value it highly for breeding, both for the fine form and good substance that it often imparts to its progeny, and for the occasional distinctive pink in its descendants.

The lovely immaculate CHINESE WHITE performs well either in pots or in the garden, and it is difficult to visualize a more transcendently lovely flower. It is true that it demurely hides its face for a day or two but this failing can be excused when it lifts its head exposing its serene loveliness for all to view. Very free blooming is RUBRA which gives perfection of form and finish with bright orange red coloring, it being one of our favorites for cut flowers. It is one of the most free seeders that we grow, and nothing has given a higher average of lovely cut flowers among their progeny. A pot of RED HACKLE gave flowers of quite startling brilliance, while CROMARTY was the peer of all the yellows so grown.

In the field, one of the very first flowers to open was CIBOLA, an intense deep golden yellow from MALVERN GOLD x TRENOON. Inasmuch as it was nearly ready to open when the cold spell struck, it was damaged considerably by the freeze. Quite a large flower for one so early, it has much substance and lasts a long while, either on the plant or as a cut flower. Several early seedlings from KING OF THE NORTH and KANDAHAR by CONTENT had blackened foliage but still gave creditable blooms; others showed little damage to the plants. From this series came several quite outstanding flowers in selfs of butter yellow and sulphury lemon, and a few quite striking reversed bi-colors of good form and substance.

By the end of March, flowers began opening rapidly, and April was a warm dry month with drying winds which cut short the life of the flowers. Daffodils which normally last about three weeks looked very tired after ten days or two weeks, and it was quite useless to attempt properly to evaluate new seedlings in the most exposed locations. Ordinarily, winds that blow at this season of the year are accompanied with relatively high humidity, and while the flowers may get bruised somewhat, their life is not greatly shortened. Red cupped flowers were, on the whole, rather disappointing, and many of the pinks failed to develop much color. Yet, in spite of this, there were many good specimens. White Daffodils, of course, came very pure and clean.

Some years ago, out of a very small lot of CHEERIO x MARKET MERRY seedlings, we selected one which has since been called ARDOUR. It is a very circular large flower with broad overlapping perianth, and has much substance and splendid vivid red and yellow coloring. Although it does not fade badly, the edges of the cup burn in hot sun or wind. We find it one of the most valuable from the standpoint of breeding, and its pollen used on KLINGO and BAHRAM gave a number of flowers of good color and form, one especially from KLINGO having a large flaring, almost flat crown of most intense red which has been very resistant to weathering. An exceptionally large flower with immensely broad perianth of deep yellow and a wide spreading highly colored crown came from MARKET MERRY x CARBINEER, and from TAMINO x CHUNGKING we had another large flower somewhat like CHUNGKING but larger.

The quest for good yellow trumpets goes on and we bloomed several rather promising candidates from CAMBERWELL KING x MORTLAKE, one being a large flower of very good form borne on tall strong stems having a perianth broad like that of KANCHENJUNGA, the noted white trumpet,

but flatter in form. ST. ISSEY x GALWAY produced some good border line flowers, but out of CAMBERWELL KING x GALWAY came a series of very nice trumpets, the best of which appeared at least equal, if not superior, to any yellow trumpet seen here.

TROSTAN x ZERO gave some very nice white trumpets, of which two looked especially good, the flowers being of good substance, and borne on tall strong stems. Some extremely large well formed very white flowers were derived from KILLALOE x BROUGHSHANE, but these could have taller stems. Two or three large whites with massive trumpets descended from PEARL HARBOR x KANCHENJUNGA, and another very white flower of large size with a much frilled flaring trumpet of better quality than one might anticipate was produced by ADA FINCH and KANCHENJUNGA.

Pinks readily become an obsession with a Daffodil breeder, and with the many good varieties now available, progress should be rapid in the next few years. Here, WILD ROSE is still one of the clearest pinks; ROSARIO, the most perfect flower; and MABEL TAYLOR, the most spectacular. ROSE OF TRALEE has less color but comes with fine form and is one of the very latest of large Daffodils to flower in addition to being one of the most prolific bloomers. INTERIM is quite distinctive from other pinks being a flower of high quality and very valuable to the hybridist. From it crossed with MABEL TAYLOR both ways virtually every seedling was pink, several having very good color and nice form. One of the best had a wide band of rosy orange with an interesting frill—quite unique. Several distinctively formed pink trumpets resulted from PINK LADY x SHOT TOWER, one having rather a long salmon pink trumpet with a heavy frill, and another a large bell shaped trumpet of similar coloring. But the real surprise of the year came in a seedling from GREEN ISLAND and GLENSHANE a flower of quite large size with very rounded broad perianth rather reminiscent of GREEN ISLAND and a rather short but flaring crown of apple-blossom pink whose color held for the life of the flower. Coming from a fourth year seedling, we hope that it does not deteriorate in any way nor lose any of its coloring in future bloomings. A most interesting little flower like a miniature WILD ROSE with a frilly cup came from (MITYLENE x MRS. BACKHOUSE) x WILD ROSE, while SHIRLEY WYNESS x MABEL TAYLOR produced large numbers of ruffled pinks, several being quite good flowers. Other than those already mentioned, LOUGH MAREE has proven one of the most popular of the named pinks we grow. It is quite a large flower with a large crown of lilac toned pink, and retains its color well. PINK O'DAWN is a flower of good quality and nice coloring, and has proven a good breeder. Larger and of somewhat better quality than WILD ROSE but with slightly paler coloring is LISBREEN. ROSEGARLAND like most of the other pinks varies in coloring from year to year, but at its best is one of the finest of the group and it comes on good tall stems. There are many other pinks of good quality, among them being PINK A DELL and some of the new HOLLAND pinks which we have not yet had opportunity to properly evaluate.

CHINESE WHITE pollen used on GREEN ISLAND produced a series of

exceptionally finely formed flowers, among which was the most perfect bloom of the season, an ivory white of flawless form much like its pollen parent in design, but with heavier substance and the flower held at right angles to the stem. Such flowers are ideal for exhibition and serve admirably for arrangements. Several somewhat similar but not quite so perfect, and slightly smaller flowers came from RUBRA x SYLVIA O'NEILL. Virtually every flower from this cross was of ideal type for cutting, and most were white with white or cream cups banded with lemon, buff, or orange, and sometimes daintily frilled.

Thus far more consideration has been given the seedlings than named varieties, but many of the latter were better than normal despite the adverse weather. The whites in particular were fine although a bit shorter lived than usual. There were superlative blooms of the beautiful CANTATRICE, and the niveous ZERO was exceptionally fine, while MORAY and COOLIN were larger than we had ever seen them previously. Because of its exceptional substance, GREEN ISLAND gives a percentage of flowers that are a bit rough, but it was very smooth this year. All of the sister seedlings and half sisters of CHINESE WHITE were good as usual; our choice falling to FOGGY DEW, TINSEL, GLENSHANE, and SYLVIA O'NEILL. We are quite partial to the small crowned, light colored flowers as many of these combine perfection of form with airy grace making them admirably suited to arrangements. Though no longer new, SAMARIA with its smooth milk white perianth and frilly-white bordered green eye is a great favorite. The smaller CUSHENDALL is ideal for table pieces as is also ANGELINE with its delightful gold rimmed cup, and the green eyed poet, CANTABILE. ALBERNI BEAUTY is one of the very last to bloom and has rather large flowers, similar to SAMARIA but with lemon frill, borne of very tall stems. SILVERMINE, SILVER SALVER, and POLAR SEA, all pure whites with green eyes are distinctive from one another and each is a gem for cutting.

As indicated above, red and yellow flowers were not as good on the whole this year as on the average, but there were numbers of varieties which gave a very good performance. GARLAND and DUNKELD are two flowers of most attractive form with wide flaring red crowns and very broad overlapping rounded perianths. NARVIK should be one of the leaders of the future because of its excellent form, good keeping qualities, and brilliant coloring, although it is not one of the larger flowers. Not so smooth nor of exhibition form, RED RIBAND is certainly one of the most striking, being of clear yellow with a strongly contrasted ribbon of bright orange red in a flower about the size of its illustrious forebear, FORTUNE. ARMADA and CEYLON doubtless are two of the best new ones.

Most of the red and white flowers are not large, but FERMOY would be rated a large one in any section. It is outstanding in its class, having a very large flat white perianth and big flaring crown of orange shading to yellow at the base. Another outstanding member of this group is KILWORTH whose good form and brilliant color make it most desirable. It is among the short cupped varieties that we find the most brilliant coloring, and LIMERICK is still a favorite with us. PAPRIKA, TEBOURBA,

BRAVURA, and OTRANTO are others of excellent quality. Then there is BLARNEY, a beautiful flower with smooth white perianth and salmon orange crown bordered primrose. The unique ARTIST'S MODEL is of similar coloring, but instead of having a border of different color, it is flanged and rolled backwards touching the perianth. Several of the Lewis varieties from New Zealand are quite distinctive; AUTOWIN has a large broad flat white perianth and the flat saucer shaped crown is yellow with a most distinct frilled border of bright orange red. MARIE LOUISE is of similar form but with a lemon frill, and PAPANUIE QUEEN somewhat the same but a larger flower.

Even though our season was much shorter than usual and we were forced to be absent from home too much of the time, we had many beautiful flowers and these notes touch only some of the highlights. It is amazing at times to see how Daffodils can come through trying adverse conditions and still give a good performance. Naturally there are some disappointments but there are pleasurable surprises to counteract these, and the fancier is optimistic enough to anticipate that next season will be better!

CRINUM ZEYLANICUM (?) IN FLORIDA

WYNDHAM HAYWARD, *Florida*

The so-called MILK AND WINE LILY, most widely grown of any *Crinum* species in Florida, shown in the accompanying photograph, is probably *Crinum zeylanicum* [Fig. 15]. This is subject to corroboration by further research into the identity of the various *Crinum* types which have virtually made Florida their own in the past several centuries since Ponce de Leon's arrival in 1513.

The foliage is handsome, forming a miniature fountain of its light greenery, leaves up to two or three feet long, and three or four inches wide at the widest. It is found in numbers on country places, and in the older parts of the towns and cities, sometimes a long line extending a hundred feet or more along a driveway or across the front of a lot.

The flowers are strikingly handsome, purple-red or wine colored and striped with white edging, and the reverse of the petals similarly marked. The scapes and necks of the bulbs are reddish purple, and the bulb tissues on the outer parts are bright reddish purple. The species seems to prefer high land, contrary to some kinds of *Crinums*, and is almost dormant all through the dry, cool winter months. With the coming of the rains in June, hundreds of the bloom scapes will be seen coming up all at once in various parts of Central Florida, and the new foliage appears at the same time. The flowers open in the early evening and remain widely expanded until the heat of the next day. On cool

mornings they may last wide open till noon. Usually they tend to close partly by 10 o'clock in the morning.

The flowers have a strong, rich, sweet perfume, and when brought into the house make a fine show for an evening bouquet used at late dinner or evening house party or reception. There are few *Crinum*s so effective and spectacular in full bloom. The umbel will have a dozen to 20 buds, which open two or three at a time on succeeding nights. A strong bulb may be six to eight inches in diameter. The neck is comparatively short, two to six inches long. Usually the bulbs are four or five inches in diameter.



Fig. 15. *Crinum zeylanicum* (?). Photo by Wyndham Hayward.

Baker gives *Crinum zeylanicum* specific rank, while Herbert in 1837 classed it as a variety of *Crinum ornatum*. The bulb is apparently one of a large group of similar *Crinum* species, widely distributed in tropical Africa and Asia. Baker calls it the "commonest species in cultivation" and it is certainly that in Florida, despite its slow growth, both from seed and by offsets. To have produced the large number of bulbs growing over Florida the species must have been well established in the Sunshine State for two or three centuries. Possibly an importation by early Spanish seafarers from the Far East, as the Manila-Panama-Acapulco-Vera Cruz sailing route to Spain went up the East Coast of Florida channel for many years.

The bulb is globose, leaves six to ten, thin, lorate and bright green, with wavy margin. The peduncle is strong and heavy, never needing

support while in bloom unless a storm or accident lays it low. The seeds set readily and several usually form from an umbel. The peduncle falls sideways to the ground when the seeds become too large and heavy, and the seeds continue to ripen and mature on the end of the scape as it lays on the ground. Many times they sprout, take root and grow right in the same place and new bulbs are formed. Growth is slow, possibly ten years or more being required to obtain a large bulb from seed.

This species should be a valuable one for hybridizers. Possibly it was one of the parents of the wine colored hybrid *Crinum* clone ELLEN BOSANQUET, created by L. P. Bosanquet at Fruitland Park, Florida, a few decades back. The individual flowers of *C. zeylanicum* when fully expanded are remindful of an *Amaryllis*, and up to six inches in diameter, in the best specimens. There seems to be but little variation among the specimens of this species as seen growing in Florida yards and gardens whether raised from offsets or seed. It requires no special culture, and may be said to make its own way into the hearts of the people by its sheer beauty and spontaneous eruption of bloom stalks, with the coming of the summer rains.

SELECTION OF NEW HEMEROCALLIS HYBRIDS FOR GARDEN VALUE

GEORGE GILMER, *Virginia*

The best way to tell whether you like a hybrid *Hemerocallis* is to grow it in your own garden two or three years. Some produce the best flowers at the beginning of the blooming period, others at the end. They vary some from year to year. Something can be told by seeing them grow for others. It would take six or eight visits at two-week intervals to see all of mine in bloom. Visiting and selecting plants is not very practical especially if you want early and late varieties as well as mid-season.

Seeing them grow for another is far from satisfactory. Many are as fine at sunset as at morning, while others are ruined by a full day of hot sun. Some grow plants protected from fading by shade while others grow theirs in the full sun. Some cultivate theirs frequently while I grow mine under mulch with no cultivation. There are differences in rain and temperature and soil. Night temperature affects the formation of red pigment in some.

Relying on ratings is far from entirely satisfactory. A plant can rarely get wide enough distribution under six years to get a good rating. At least half the best in any year are surpassed by new introductions within six years. Sixteen of the hundred having the highest rating in 1950, published in 1951, had been discarded by me as no longer in my

best two hundred. More would have been dropped if I had all the good new ones. A number will be discontinued this year. I believe at least half the "best 100" have been surpassed.

With three hundred or more introductions most years no one can have money, time or space for them all. The introductions of a breeder have a general family resemblance. This is natural because they are bred from the same stock and selected by the same grower. I find that I can count on plants from some breeders to give 90% or more excellent specimens, while with some breeders I have discarded over 75% as worthless.

Norton specializes in early and late varieties; Wheeler in broad petals, small to medium, mostly dark colors; Cook in sunfast yellows and vigorous; Taylor and Lester in pastel shades; Sass in large sunfast; Culpeper in large flowers, vigorous.

The leading breeders are a stable group. Rarely does one cease except from death or extreme old age. In this group there are usually one or none in a year. The ratings of hybridizers made for your climate, soil and taste would change but little in ten years. There is a 100% change annually in the new introductions. If you get a rating of five or ten of the best breeders, they could easily supply you with 90% of the new varieties you need to keep up to date collection. Try a few others annually so as to find now and then a new breeder to add to your selected group, as the older ones may die or you want the excitement of more new varieties. I have tried the plants of some thirty or more breeders, but 90% of my best are from ten. Do not let over 10% of your plants be the product of any one breeder. This is easy for there are dozens of active breeders. Then make your own rating card for each breeder. You will generally find new introductions better than the old ones. If you try, say Stout's, and find 80% satisfactory, you can buy his new introductions and almost certainly find 80% will please you. If you find only 10% of "John Doe's" do well for you you should drop him as his new ones would probably be only 10% satisfactory.

I get all the new ones from six breeders. Two of these in the last ten years have only introduced six or eight. There are a number who regularly introduce around a dozen annually. Milliken introduced only one, HIGH NOON, in 1948, none in 1949 and 1950 and only one in 1951. Such extreme conservatism usually means high quality. There are five hybridizers whose plants are 50% or more excellent in my garden and I get some of theirs most years. There are some that rate lower and I try a few now and then, when my friends insist on giving me some. There are over a dozen I am planning to rate.

A. B. Stout and John B. Watkins bring out all of their new ones at never more than \$3.00 a plant. They are both careful breeders. You can try three or more of theirs for less than some ask for a single new plant. Do not go too fast. Feel your way slowly. There are new ones coming far ahead of any now available.

HYMENOCALLIS NARCISSIFLORA

LEN WOELFLE, *Ohio*

Much as we dislike to change, once we have acquired a habit, it is not logical to continue an error knowingly. *Ismene*, long considered a separate genus in the AMARYLLIS FAMILY, is so closely related to the *Hymenocallis* that it is now classified by botanists as a sub-genus of the latter. That species long known under the incorrect appellation of *Ismene calathina* has now been correctly titled *Hymenocallis narcissiflora*, literally, the narcissus-flowered *Hymenocallis*. We should accept the correct name and use it in all future references to this plant.

I believe this fine species could be grown in the open ground anywhere in this country during the summer months, given handling as it receives here in southern Ohio. It is not at all particular as to soil. Most anything from a stiff loamy soil to a sandy loam should be satisfactory, with an acid reaction of neutral to slightly alkaline.

It will tolerate some shade and thrives in full sunlight. It may be grown in large pots or in the open soil in the border or garden over summer. It completes its growth cycle in about five months, when the bulbs may be dug, the tops and roots cut off near the bulb, and then stored dry and warm over winter in a temperature above 50 degrees F. In warm climates where frost will not reach the bulbs, it may be left in the ground the year around, being dug only to separate the bulbs to prevent crowding.

The beautiful, waxy-white texture of the bloom and delightful fragrance as a cut flower, make this a most desirable plant, and so easy that even a child can be sure of success with it.

They are particularly attractive when planted in clumps of three or four bulbs in some sunny corner, or if planted in front of *Lycoris squamigera* so that they may lend their foliage when these plants bloom on naked stems in late summer. The foliage too, could hide the yellowing foliage of tulips or *Narcissus*, since that of *Hymenocallis narcissiflora* remains in good condition the whole summer, come storm or drought.

They seem to be very disease free, and the only insects causing a problem are the Narcissus Bulb Fly and the Lesser Bulb Fly when they are in the neighborhood. I have found *Gladiolus* Thrips damage to buds of late blooming *Hymenocallis* in September, but never on *H. narcissiflora*, as it blooms from June to July before these pests become active.

THE PERUVIAN DAFFODILS

WYNDHAM HAYWARD, *Florida*

The sub-genus *Ismene* of the beautiful *Hymenocallis* group of amaryllids is, thanks largely to the efforts of English and Dutch growers and hybridists, attracting more attention than in many decades. They are somewhat particular in their culture, but may be classed among the easier bulbous plants to grow when they are given proper treatment, and their reward to the horticulturist and flower lover in the form of pure ecstatic beauty and sheer fantasy of nature is immense.

The foundation species of this deciduous section of the *Hymenocallis* is *H. (Ismene) narcissiflora*, which was known to Jaquin in the late 18th century as *Pancratium narcissiflorum*. Baker, the last botanist



Fig. 16. *xHymenocallis* clone ADVANCE.
Photo by Wyndham Hayward.

to monograph the *Hymenocallis* group, made *Ismene* a sub-genus of the same, although its character is so distinct as to warrant a separate generic place in the opinion of some students of these plants.

It is a good sized bulb at best, up to 3 inches in diameter, dormant in winter and producing handsome foliage atop a long sheathing neck, and having two-edged scapes bearing umbels of two to five of the most exotic-appearing and extravagantly fashioned white flowers in all the realm of the amaryllids. Only the closely related *Elisena longipetala*, recently itself assigned to *Hymenocallis* by MacBride in his *Flora of Peru*, can surpass it as a creation of nature's fantastic imaginings.

Back in William Herbert's day of the early 19th century, these

choice bulbs attracted much attention of horticulturists, and the learned Dean reports a hybrid between *H. narcissiflora* and the unique yellow species, *H. amancaes*, the result being figured in the Botanical Register, 20: 1665. He called this hybrid *Spofforthiae*, and describes the flower as sulphur yellow.

This hybrid was apparently lost with the years, and the cross was repeated by the Dutch firm of Messrs. C. G. van Tubergen, Ltd., and the resulting duplicate cross was called SULPHUR QUEEN. This bulb is now available at reasonable prices both in Europe and America from specialists. The Van Tubergen firm deserves high praise for the promotion of the cultivation of all the members of this sub-genus, which have been listed for many years in its catalogues. Their continued interest in the group has doubtless contributed largely to the increase in popularity of the bulbs in recent years.

Besides *Hymenocallis (Ismene) amancaes*, which is a golden-yellow-flowered species, found in a certain valley of *Amancaes*, near Lima, there are available today the elegant *Elisena longipetala*, from the Andes of Peru and lower Ecuador. There are two other species of *Elisena* listed by Baker of which nothing is known in cultivation, *E. ringens* and *E. sublimis*, all from the Peruvian Andes.

xHymenocallis clone FESTALIS is an horticultural hybrid raised by the late Arthington Worsley, of England, leading specialist of the *Amaryllis* Family in the 20th century until his death. *xHymenocallis* clone FESTALIS crossed back on *H. narcissiflora* gave a seeding which proved to be more free-flowering and more vigorous in constitution which has been called ADVANCE [Fig. 16], in the trade. The original type of *H. narcissiflora* tends to be shy blooming in the trade, often splits up into too many offsets and sometimes rots away at the base, whether in the ground or in storage.

This new hybrid ADVANCE is now available in quantity, and multiplies well from mature bulbs. It has replaced to all practical purposes the old *H. narcissiflora* species. The flower of ADVANCE is larger than that of the old type.

Almost as large and vigorous as ADVANCE is SULPHUR QUEEN, the splendid light yellow hybrid. In this the cup is very large and more open than in ADVANCE, probably due to the more open funnel shape of the corona in AMANCAES, which can be seen in Plate 184 of 1940 HERBERTIA. Bulbs of ADVANCE grow about as large as those of the old *H. narcissiflora*, up to 2½ inches diameter.

Mr. Worsley's FESTALIS is still a popular pot and summer garden subject among connoisseurs of fine bulbous subjects, but is not nearly as well known as it should be. It has a fascinating fairv-like quality with its long curving segments and frilled membrane. The petals are waved and twisted. The plant will grow outside in warm climates where the conditions are favorable. The bulbs of *H. amancaes* are of delicate constitution and should be handled in pots with protection indoors or under glass, except in warm climates.

All these beautiful bulbs can be obtained as dormant stock in

winter and with good care can be forced into bloom indoors or under glass in the spring. As usually sold they are without roots, but if dried off in their original pots, a good part of the root system, which is thick and heavy, will remain alive and will help the bulb to re-establish itself in the spring after repotting or replanting.

There is a similar Ecuadorean bulb bearing a single large Hymenocallis-like flower which was recently placed in the new genus *Leptochiton*. This is one of the finest things in the *amaryllids* but only a few bulbs are in cultivation. It should have Ismene treatment. It was formerly called *H. quitoensis*.

Two or three of the Mexican species of Hymenocallis including *H. harrisiana* and *H. concinna* are suitable for Ismene-type culture as they go dormant in winter. *H. harrisiana* is available in the trade.

The bulbs of the Ismene group like those of *Nerine* require particular attention to drainage. Herbert in his AMARYLLIDACEAE of 112 years ago says that "absolute rest in winter is essential to this genus, which delights in very light soil; . . . its cultivation is easy when these two requisites are observed." The bulbs are a complete failure in heavy, moist soil, or in a potting mixture too heavy, rich or well manured.

A very sandy soil with just a little leafmold or compost is recommended, with extra care to assure perfect drainage and special caution in watering. In garden culture, the bulbs should be dug with all their roots by the time of November frosts, stored dry in flats of dry sand or earth, and kept moderately cool and dry until the following March or April. Plenty of sunlight is good for the garden types.

ALLIUM GIGANTEUM IN THE ROYAL PARK, VRANA, BULGARIA

J. C. TH. UPHOF, *Tampa, Florida*

It was during a pleasant morning in the middle of the month July, 1936 that an Officer of the Royal Court in Sofia handed me at Hotel Slovienska Beseda a note in German from Dr. Iwan Buresch, Director of the Royal Institute for Natural History. The message translated in part is as follows — "We will drive today at 9:30 o'clock to the Palace Vrana. There you will meet His Majesty the King. Please come to me at 9 o'clock." We left the Palace grounds in Sofia by auto at the exact hour and in less than an hour we arrived at the main gate of the Summer Palace Vrana near the outskirts of Sofia where I was soon presented to His Majesty Boris III, King of the Bulgarians. He was standing in the Royal Park about half a mile from the gate.

In this park is an enormous wealth of plant species. There is more to be seen than in an average European botanical garden. Moreover,

most species and numerous varieties are hardly found in other collections, because the King wanted to have unique collections.

When passing through various parts of the extensive park, the King explained to me many interesting features of his plants and the way he got them. Suddenly we stood before a large area. It was a field covered with a vast number of all kinds of herbaceous plants. I had never seen such before. It could not be compared with the well known herbaceous borders because it was too wide and too extensive. The King told me that during the Turkish rule of his country, this space was covered with a number of old buildings and stables, which he had removed. The soil was thoroughly dug and heavily manured. This he planted with a variety of tall herbaceous plants. It was a kind of experiment. There were numerous species of *Centaurea*, *Lilium*, *Hemerocallis*, *Paeonia*, *Phlox*, *Iris*, *Rudbeckia*, *Papaver*, *Rodgersia*, *Senecio*, *Eryngium*, *Astrantia* and many other genera. There were heavy, lovely flowering specimens of *Eremurus robustus* and *E. Elwesi*. Floricultural experiments were also made with a number of herbaceous Balkan species

Among this mass of plants the King drew my attention to an interesting *Allium* which stood out in contrast with the rest of the species that were planted. He said to me [in German], "That is *Allium giganteum*. The bulbs I got from Asia. Please photograph it for me?" Fortunately the photo proved to be good with which he was very much pleased. A reproduction of it is shown in this article [Plate 15]. The King also told me that he wanted me to have seeds of this *Allium*. Later he sent me some seeds at Amsterdam which I received a few years later in Florida. They came to me too late; consequently they had lost the power to germinate.

It was E. Regel who first described this *Allium* species in GARTENFLORA 32: 97, 1883. His description is accompanied by an excellent illustration on plate 1113. It is surprising that this attractive species has not become widely known as an ornamental in different gardens. *Allium giganteum* Regel produces a robust flowering stem that reaches a height of 1 to 1.50 meter. There are 5 to 6 leaves which have a width of 5 to 10 cm. The veins are not easily visible. The stem and leaves have a strong glaucous color. The spathe is bivalvate and half as long as the umbel. The flower cluster is large, heavy, carrying a dense cluster of literally hundreds of flowers. The perianth of these flowers is light-violet which makes a flowering specimen very beautiful, and on account of the large size of the plant, it is something unusual for an *Allium* species. The bulbs are from 4 to 6 cm. in thickness, and are ovoid in shape.

Regel states that the plant comes from the Himalayas. At first he hesitated to describe the plant as a species, and considered it a form or variety of *Allium stipitatum* Regel which he had described in GARTENFLORA 355, 1881 and which was illustrated on plate 1062. Later he concluded that he had to do with a distinct species. There appeared later also a description of this species in BOTANICAL MAGAZINE of 1885 with a colored illustration on plate 6828.



Allium giganteum Regel, in the Botanic Garden, Royal Park, at Vrana, near Sofia, Bulgaria.



'Twas the Night Before Christmas

Plate 16

'T WAS THE NIGHT BEFORE CHRISTMAS

MRS. MARY G. HENRY, *Pennsylvania*

Christmas day 1950 was one of the gayest days of the year in my tiny greenhouse. This was in happy contrast to bygone years when, before I started to grow *Amaryllis*, there was little in bloom during the month of December excepting a few orchids in the "orchid corner" of the greenhouse.

A few days ahead of Christmas it just seemed as though the *Amaryllis* wanted to get ready for the great day and rejoice along with the rest of us, and they certainly decorated the little greenhouse to the very best of their ability.

The flowers shown in the picture, Plate 16, face the glass dining room door.

The *Amaryllis* making the handsome striped effect is *Amaryllis organensis* var. *compressa*, whose striking flowers are green, embellished with dark red markings. It is an impressive and exotic looking flower and stands high among my favorites.

The *Amaryllis* on the lower right is *xAmaryllis henryae* with its sister seedling not far off. Both of these are of an exquisite soft and gentle rose-pink.

xAmaryllis gladwynensis was utterly gorgeous arrayed in brilliant velvety rosy carmine and already opening its second stalk of four large flowers.

xNerine clone LADY STIRLING MAXWELL, in rich crimson, always brings to my mind happy memories of Edinburgh. It was a gift from my esteemed friend, Sir Wm. Wright Smith.

A small yellow *Cyrtanthus* opens the winter season for this genus and in the rear is a large pale pink *Crinum* whose foliage is as handsome as its flowers.

Plate 16. [See opposite page.] 'Twas the Night before Christmas—*Amaryllis* and cypripediums in flower at the Henry Home, Gladwyne, Pennsylvania, in 1950. From left to right, *Cypripedium harriseanum* clone G. S. BELL, large maroon flower, and barely visible against the background; hybrid *Cyrtanthus*, with three open flowers; *xAmaryllis henryae*, carmine pink, one flower open, the other just opening; *xCypripedium maudiae* (albino), in foreground; *xAmaryllis gladwynensis*, stunning, "currant red, orange glow," two stalks, 4 flowers each, one stalk past flowering with one seed pod; *Amaryllis organensis* var. *compressa* with one flower open; again, *xAmaryllis henryae*, carmine pink, with one flower open; in background, *xNerine* clone LADY STERLING MAXWELL, carmine. It should be noted that in upper right, the lower two tepalsegs of *Crinum moorei*, pink-flowered form, may be seen. Photo Philadelphia Sunday Bulletin.

Christmas Eve, about 9 o'clock, the members of the Gladwyne Fire Company arrived as usual on their huge red fire engine to the tune of Christmas carols from a loud speaker and with a real live Santa Claus. The children, grandchildren and I were thrilled and excitement was intense. We entertained our visitors with a simple spread and soon they said good-bye 'til next year.

After filling the stockings we trimmed the tree 'til nearly 12.

Then came the beautiful midnight service in our little country church, that told us Christmas had come.

It was about 1 A.M., when I returned from church. The Christmas tree sparkled through the front door.

As usual I visited the little greenhouse for a last good-night.

It was early Christmas morning now and surely decked in all their fresh bright beauty the *Amaryllis* were worthy of the day.

THE HEAT FACTOR IN RELATION TO AMARYLLID FLOWER COLOR

L. S. HANNIBAL, *California*

For a number of years the variation in the flower color of *Brunsvigia rosea*, the CAPE BELLADONNA LILY, has been noted without a plausible answer being discovered. In all instances the uniformity of pigmentation seemingly covered most of the state. The summer of 1950 was exceptionally warm and here in Sacramento the thermometer hung above the century mark for two full weeks between late July and early August. The Cape bulbs were a dirty bleached out white. This was sharply contrasted by those observed growing up along the northern California coast line near Eureka. Temperatures there had held to a foggy 60-70 degree chill, and the flowers were a near coral red. The answer was evident: Heat. And it has been verified conclusively this year. The daytime temperatures at the opening period of the individual blossoms of the flower umbel definitely establish the amount of red pigmentation that is present in the blossom.

Similar color variations appear in *Crinum*. *C. Moorei* is an example. One of the most striking cases of color variability has been observed in a *C. bulbispermum* (syn.—*C. longifolium*) which Mr. Wyndham Hayward gave me some years ago. Either shade or overcast make a striking contrast in color. It is not unusual to have both white and deep rose blossoms in the same umbel at the same time. Those that open when it is cool are always deeper toned. Light and heat intensity have no apparent effect once the individual florets have opened fully.

THE AMERICAN PLANT LIFE SOCIETY

For the roster of the general officers of the Society, the reader is referred to the inside front cover of this volume.

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[An integral branch of the APLS, and functions as a comprehensive Committee for the advancement of the Amaryllids.]

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[Members of the Hemerocallis Jury are *ex officio* members of the Daylily Committee.]

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- | | |
|---|--|
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Note: Introducers of new daylily clones should send plants directly to the Trial Gardens for testing. As soon as practical each trial garden will publish, in *HERBERTIA*, lists of the 10, 25, 50 and 100 best daylilies, on the basis of the clones tested, for the climatic region in which it is located.

DATA CARD FOR HEMEROCALLIS

When describing daylily clones, all breeders and growers are requested to use the Official Data Card for Hemerocallis, devised by the eminent artist and horticulturist, J. Marion Shull, and full described in *HERBERTIA*, Vol. 7, 1940, and Vol. 14, 1947. These cards should not only be used in describing new clones but also for the description of all older clones grown in the various climatic regions.

For information write to—

*Mr. E. Frederick Smith, Membership Secretary,
 The American Plant Life Society,
 Box 2393, Stanford, Cal.*

SCORE CARD FOR HEMEROCALLIS

For the official score card for Hemerocallis see *HERBERTIA*, Volume 7, page 126, 1940. Reprinted in Vol. 14 (1947), page 37.

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FLOWER TYPES AND SCORE CARD FOR HYBRID AMARYLLIS

For classification of flower types and score card for Hybrid Amaryllis see
PLANT LIFE 6: 43-46. 1950.

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AMARYLLID PUBLICATIONS

For information on past issues of *Herbertia*, see pages 170-171.
Here also are brief reviews of amaryllid publications in book form.

PLANT AWARDS FOR 1951

For awards to amaryllids in 1951, see page 171.

OTHER PLANT COMMITTEES

For other Plant Committees, see page 170.

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 90.]

Zephyranthes sessilis Herb., Amaryll. 175. 1837. Leaves slender, semi-cylindric, green . . . twisted; bud sessile, the tube more than $1/24$ th [inch long?], with a pair of very minute prickles at the base of each petal; the limb white, the sepals becoming more or less reddish on the outside; scape deflexed at time of seed-shedding; style conspicuously deflexed. Mexico.

Zephyranthes grahamiana Herb., Amaryll. 175, pl. 29, f. 2. 1837. Leaves unknown; scape 3 inches tall; spathe $1\frac{3}{8}$ [inch long], tubular half way up, inflated at the base, bifid (or fenstrate) above; bud sessile, $1/4$ inch long; perianth $1\frac{7}{8}$ [inch long], its tube very slender, $7/8$ inch long, the limb 1 inch long, the segments oval, more than $3/8$ [inch] wide (pale purple, becoming yellowish below, in dry specimens); filaments $3/8$ inch [long], free; style suberect, surpassing the tube by $1\frac{3}{8}$; stigma-lobes obtuse; anthers $1/24$ as long as the limb. Mexico.

Eucharis lehmannii E. Regel, Gartenflora 38: 313—314, p. 1300, f. 1 & 1b. 1889.—Glabrous throughout; Bulb attenuated toward the apex from a rounded base, invested by an entire tunic; leaves radical, 2, oblong-elliptic, attenuate into the petiole, acuminate into a rather obtuse apex, with a central midrib, numerous longitudinal nerves, and 2 or 3 folds running to the tip; scape rather flattened, with one leaf longer, the other shorter; umbel terminal, 4-flowered supported by linear or linear-lanceolate scarious bracts which are half as long as the peduncle; peduncle about 3 cm. long; the tube of the white flowers slender, slightly shorter than the lobes of the perigonium, only slightly ampliate at the apex; segments of the 6-parted limb spreading, slightly undulate, the exterior ones ovate-oblong, the interior ones ovate and scarcely longer than the exterior ones; stamens attached in the throat, shorter than the segments of the limb; filaments connate at the base into a petaloid blade, above the base into a 6-parted cup, the petaloid blade cuneate-dilated, deeply bilobed at the apex, with the midrib excurrent from the sinus of the lobes as an antheriferous thread slightly longer than the lobes; ovary inferior, obtusely trigonous, ovate, 3-celled; style filiform, crowned with a 3-lobed stigma; ovules many, in 2 series in each cell; seeds aborted, few.

Hymenocallis longibracteata Hochr. in Bull. N. Y. Bot. Gard. 6: 265. 1910.—Leaves ribbon-like, glabrous, sessile; peduncle probably slightly shorter than the leaves; flowers 3—6, disposed in a small head; spathes very large, scarious, sometimes longer than the tube of the corolla; tube of the corolla medium-sized the segments equaling the tube, linear, acute; filaments long, almost equaling the corolla, dilated at the base into an infundibular staminal cup with a more or less fringed mouth; anthers linear, long, dorsifixed at the lower $1/3$ or $1/4$; style conspicuously longer than the stamens, filiform, its apex capitate.—Leaves.

as far as seen, about 45 cm. long and 1.4 cm. wide; peduncles as far as seen, to 38 cm. long; bracts to 12 cm. long or longer; tube of the corolla 11—12 cm. long or longer, the segments to 10 cm. long and 0.5—0.6 cm. wide; filaments filiform, about 5 cm. long; anthers 1.5—2 cm. long and 1—0.5 mm. wide; staminal cup about 1.7 cm. in diameter (wide) and 2 cm. long; style surpassing the margin of the staminal cup by about 7 cm. Mexico, Orizaba (Fred. Mueller, s.n., June 18, 1853, in the herbarium of the New York Botanical Garden).

Hymenocallis biflora Koch et Bouché, in Wochenschr. 9: 369—370. 1866.—Leaves perennial, spreading, lorate, but more narrow at the base; scape 2-flowered; tube of the corolla longer than the segments; corona finally expanded, almost rotate; cells of the ovary possessing 4 or 6 ovules. Brazil.

Eucharis ulei Kraenzlin, in Engler, Bot. Jahrb. 50: Beibl. 111, pp. 4—5. 1913.—Bulb not seen by me; leaves 2, very long-petiolate, oblong, acute or short-acuminate, thin-membranous in drying, the petiole narrowly margined at the base, to 35 cm. long, the blades 20—22 cm. long, 7 cm. wide; scape slender, more than 50 cm. long, the floral bracts ovate, acuminate, slightly longer than the pedicels, about 2 cm. long; flowers in the single specimen seen 4, the pedicels about 1.5 cm. long (varying in length in the succedaneous flowers); ovary semi-globose, horizontally flattened above, 8 mm. long, 1.2 cm. in diameter; corolla-tube slender-cylindric, almost making a semicircle, deflexed, abruptly divided into 6 segments which scarcely differ among themselves and are ovate, acute, and spreading, the tube about 3 cm. long when extended, 1 mm. in diameter, the segments 2.5 cm. long, 1 cm. wide or slightly narrower; filaments connate for about the lower $\frac{1}{3}$, the free part subquadrate, the upper margin obtusely toothed or shouldered, the whole "paracorolla" 7 to 8 mm. high, divergent above, 1.3 cm. in diameter at the upper margin; anthers linear; style slender, scarcely shorter than the corolla-segments; stigma small.—Flowers white, blooming in June.

Allium sessile R. E. Fries, Act. Soc. Sci. Upsal. ser. IV. 1: 165. 1905.—Bulb with a long neck; stem very short entirely hidden by the sheaths of the leaves; leaves very many, linear, flat; umbel not bulbiferous, many-flowered; pedicels three to many times as long as the perigonium; sepals oblong-lanceolate free, whitish, marked with a green nerve; filaments simple subulate-filiform, free; ovary ovate, almost twice as long as the style. Province of Jujuy: in rocky places, at about 4000 meters altitude, Cuesta de Santa Catalina, Feb. 1, 1901 (Kurtz 11546).

Amaryllis parvula Seub., Mart., Flora Brasil. 3(1): 145. 1847.—Leaves terete; scape filiform, 1-flowered, the flower erect, on a pedicel which is $\frac{1}{3}$ as long as the spathe that is split from there up; stamens half as long as the perigonium.—Bulb the size of a small cherry, hidden by a blackish tunic, the neck $\frac{3}{4}$ inch long; leaves slender-filiform, few; scapes 2, 2—3 inches long, slender; spathe tubular below, acute at the

apex, nerved, becoming purplish, half as long as the flower; pedicel equaling the ovary; tube of the perigonium short, terete; sepals oblong-lanceolate, the exterior ones broader, acute, plainly nerved, rose, rather obscurely punctulate, the interior ones rather obtuse, white; alternate filaments longer than the others; anthers linear, curved, attached below the middle, incumbent; style slightly surpassing the filaments; stigma 3-lobed.—A minute species immediately recognizable by its elegantly bicolored perigonium and short-pedunculate flower. The synonym of Herbert because of the length of the style and the different country (Peru) is doubtful. It grows in central Brazil (Sellow 3587); perennial.

Zephyranthes longifolium Arech., Anal. Mus. Montevideo 2: 286—287. 1899.—Bulb ovoid, about 5 cm. long, 3 cm. in diameter, the exterior tunics membranous, brown; leaves cylindric, 80—120 cm. long, 5—6 mm. in diameter fistulose, glabrous; scape stout, about 25 cm. long; spathe about 5 cm. long, cylindric, bifid above, nerved, with erect valves that are subulate at the apex; umbel quite often 4-flowered the pedicels 4—5 cm. long; perianth rose, about 5 cm. long, the segments oblong-lanceolate, 1 cm. wide, equaling the narrowly funnelform tube; stamens half or $\frac{1}{2}$ as long as the limb; anthers recurved; style 3-fid, surpassing the anthers; capsule about 1 cm. long; seeds flattened, the testa black. Uruguay.

Eucharis bouchei Woodson & Allen, in Ann. Missouri Bot. Gard. 24: 181. 1937.—Bulbous herb; bulbs tunicated, broadly ovoid, about 6—8 cm. in diameter; leaves ovate-lanceolate, acuminate at the apex, attenuate at the base, 35—42 cm. long, 10—11 cm. wide delicately membranous, completely glabrous; petioles 25—30 cm. long, completely glabrous, shallowly canaliculate, slightly winged at the base; inflorescence umbellate, 4—10 flowered; peduncle rather stout, 55—60 cm. long, glabrous; bracts subfoliaceous, 1—1.5 cm. long; pedicels about 2.5 cm. long, glabrous; lobes of the perianth ovate, short-acuminate, 3—3.5 cm. long, about 1.3—1.5 cm. wide, spreading, the tube funnel-form measuring up to 3.5 cm. long and 15 mm. in diameter, later 5 cm. in length, slenderly conicdilated, the mouth measuring 6 mm. in diameter; filaments membranous-dilated, trapezoid, connate at the base, about 1.2 cm. long; anthers about 3 mm. long, caducous; ovary 3-celled, subglobose, measuring about 3 mm. in diameter; style very slender; stigma shortly 3-lobed, well exerted; fruit unknown. Panama.

Brunsvigia insizwae A. Zahlbr., in Ann. Nat. Hofmus. Wien. 15: 27. 1900.—Leaves ligulate-lorate, gradually narrowed toward the apex and obtusely acuminate, completely glabrous, rather stout, dark green (?), half-orbicular and almost dilated at the base, somewhat flexuous along the margin, smooth, 36—41 cm. long and (at the middle) 5—6 cm. wide; scape erect, quite stout, glabrous, shorter than or subequaling the leaves; umbel 10—14-flowered; spathe 2-leaved, the segments triangular, rather obtuse at the apex, glabrous, whitish, 8—9 cm. long and at the base 4—6 cm. wide; pedicels smooth, slender, 19—23 cm. long, suberect,

narrowed toward the apex; perigonium almost campanulate, 55—60 cm. long, pale carmine, the segments erect or suberect, never spreading, oblong-lanceolate, gradually narrowed toward the base, about 2 cm. wide at the middle; stamens slightly shorter than the perigonium; ovary turbinate, 1.5 cm. high and 1 cm. wide, glabrous; style declinate.—Collected by Krook (Penther 1548) at Mount Insizwa, Guiqualand East, blooming in January.

Nothoscordum fictile Macbride, in Field Mus. Nat. Hist. Bot. Ser. 11: 12. 1931.—Bulb ovoid 2—3 cm. thick with a long neck 1—1.5 dm. in length; stems very short, apparently absent, completely hidden by the sheaths of the leaves; leaves prostrate, linear-oblong, narrowly long-acuminate, 1—2 dm. long, 4—10 mm. wide; pedicels flexuous, slender, 1—2 cm. long, plainly unequal; flowers white, 4—5 mm. long; perianth-segments oblong-elliptic, shortly connate at the base; filaments subulate, about 2.5 mm. long; anthers brown, scarcely 1 mm. long; style scarcely 1 mm. long; immature capsule 4 mm. long, apparently subovoid.—Collected at Carumas, Miquegua, Peru, between February 21 and March 6, 1925, Weberbauer 7262 (type in Chicago Natural History Museum).

Eucharis narcissiflora Huber, in Bol. Mus. Para, 4: 543. 1906.—Leaves (without the petiole 17—18 cm. long) lanceolate-ovate, acute at the apex, contracted at the base into a petiole that is equally as long as the blade; scape to 40 cm. long; umbel 10-flowered; pedicels slender, 2—4 cm. long; corolla-tube slender, slightly dilated at the apex, the segments ovate-lanceolate, 2 cm. long, 6—10 mm. wide; staminal cup 5 mm. high, free; style scarcely surpassing the filaments.—It differs from all other species in its many-flowered umbels and smaller flowers (4 cm. in diameter). A similar plant, but smaller in all its parts, was collected by Castelnau, also in the Pampa of Sacramento in 1847, and was described by Baillon under the name *Calliphruria castelnaeana* Baill. (Bull. Mens. Soc. Linn. Paris No. 143, March 7, 1894). Baillon considered this plant to represent an intermediate stage between *Calliphruria* and *Eucharis*.—*E. narcissiflora* is frequent in wet places in the forest between Sarayacu and Catalina, Pampa del Sacramento, collected November 25, 1898.

Hymenocallis stenophylla Urb., Fedde, Repert. 21: 53—54. 1925.—Leaves linear, not at all or but scarcely narrowed at the base, sessile, gradually acuminate to the apex, the apex itself rather obtuse or acute 30—40 cm. long, 0.7—1.3 cm. wide; peduncle 45—55 cm. long, in the pressed condition to 6 mm. broad, 5- or 6-flowered; involucre leaves lanceolate from a triangular base, rather obtuse, up to 5 cm. long; flowers sessile; tube of the perianth very narrowly linear, 9—11 cm. long, about 1 mm. thick, the lobes shorter than the tube, gradually narrowed at the apex, up to 3 mm. wide at the middle 7—9 cm. long; stamens united below by a membrane and at that place forming a funnel up to 30 mm. long; the free portion of the filaments 3 cm. long; anthers linear, attached at $\frac{1}{3}$ their length, 14 mm. long; style surpassing the

anthers.—It grows in Cuba, Wright s.n.; in low almost marshy savannas near Jagüey Chico, province of Santa Clara, blooming in August, Ekman 16994 (type).—Related to *H. praticola* Britton & Wilson which differs in its linear-lanceolate leaves which are slightly narrowed below and its peduncle being only half as long; all other characters seem to be the same in both.

Hymenocallis sonorensis Standl., in Pub. Field Mus. Bot. Ser. 17: 229—230. 1937.—Bulb (a perfect one not seen) about 7 cm. long and 5 cm. broad, long-necked; leaves sheathing at the base, about 6, linear, 18—30 cm. long, 10—12 mm. wide beyond the middle, gradually long-attenuate toward the obtuse apex, every one long-attenuate toward the base, glabrous, many-nerved, the margins smooth; scape about 30 cm. long, slender; flowers 4, closely sessile; valves of the spathe whitish, narrow, up to 4.5 cm. long; ovary ovoid, narrowed and almost beaked, almost 2 cm. long; tube of the perianth very slender, about 10 cm. long, slightly more than 1 mm. thick, the segments narrowly linear, 6.5—7.5 cm. long, 1.5 mm. wide; corona almost 2 cm. long; filaments slightly shorter than the segments of the perianth; anthers linear, 1.5 cm. long; style very slender, slightly longer than the perianth.—Mexico: collected in a valley at Alamo, Río Fuerte, Sonora, July 1, 1936, H. S. Gentry 2267 (type in the herbarium of the Chicago Natural History Museum).

Haemanthus arnoldianus De Wild., & Th. Dur., in Bull. Soc. Bot. Belg. 40: 30—31. 1903.—Bulb tunicated, 5—7 cm. broad; leaf-bearing stem produced after the scape; leaves 5 or 6, oblong, minutely cuspidate, attenuate into the petiole at the base, the blade 6—7 cm. wide (young), the lateral veins about 12 on each side, the transverse veins very numerous, oblique; scape lateral, red-spotted at the base (according to Dewevre), long-pedunculate, the peduncle thick, about 20—75 cm. long; umbel many-flowered, about 10—15 cm. broad, subglobose, about 30—80-flowered, bracteate; bracts lanceolate, rose, spotted, 3—4.5 cm. long; flowers pedicellate, the pedicel rose, 15—35 mm. long; perianth rose (violet in drying), the tube cylindric, 10—12 mm. long, the segments linear, acute, narrow, 1-nerved, 22—25 mm. long and about 1 mm. wide; ovary green; style red, slightly shorter than the stamens; filaments red, about 30 mm. long, flattened at the base; anthers brown, 1—2 mm. long; pollen yellow. Congo.

Haemanthus eurysiphon Harms, in Engl. Bot. Jahrb. 19 (Beibl. 47): 27—28. 1894.—Precocious; bulb globose; leaves not yet fully developed, short-acuminate at the apex; scape lateral, cylindric, rather thick; umbel about 30—35-flowered, the valves of the spathe oblong or oblong-lanceolate, acute or acuminate; pedicels sometimes almost half as long as the flowers; tube cylindric, erect, slightly ampliate at the apex, $\frac{2}{3}$ to $\frac{3}{4}$ as

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MALVACEAE EDITION

EDITED BY

HAMILTON P. TRAUB

HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

PREFACE

The general issue for 1952 is devoted primarily to some species and hybrids of the genus *Hibiscus* of the *Malvaceae*. Mr. E. Sam Hemming describes the new Mallow Marvel, ANNIE J. HEMMING, Prof. Ballard reports on hybrid vigor in *Hibiscus* breeding, and Dr. Hava contributes an article on the Chinese *Hibiscus*.

Dr. Corliss reports on a joint meeting with other organizations in the Southwest Region. The issue is concluded with reviews of some outstanding books dealing with plants and plant problems.

Hamilton P. Traub
Harold N. Moldenke

December 21, 1951

***Zephyranthes insularum* Hume ex Moldenke, sp. nov.**, (syn.—*Zephyranthes insularum* Hume, *Herbertia* 6(1939): 123, pl. 150. 1940, *anglice.*). Herba bulbosa; foliis 9—21 cm. longis, 4—7 mm. latis tenuiter concavis, ad apicem obtusis; pedunculo 12—15 cm. longo, 3 mm. lato; spatha 2 cm. longa dimidio tubulosa superne bifida; umbella uniflora; pedicello 3 cm. longo; flore declinato albo, extus rubello-suffulto, ad basin viridi; ovario 4 mm. longo; tubo tepalorum 2—4 mm. longo; segmentis sepalorum ovalibus 3.8 x 1.6—2 cm., ad apicem rotundatis; segmentis petalorum ovalibus, ad apicem rotundatis, 3.1 x 1.8—1.9 cm.; filamentis incurvis 9—12 mm. longis; antheris 1 cm. longis; stylo 2.5 cm. longo; stigmatate trifido, lobis filiformibus.

***Zephyranthes plumieri* Hume ex Moldenke, sp. nov.**, (syn.—*Zephyranthes plumieri* Hume, *Herbertia* 6(1939): 127, pl. 151. 1940, *anglice.*). Herba bulbosa; foliis 1—3 lineari-filiformibus erectis 6—23 cm. longis, 1.5 cm. latis; scapo 17-27 cm. longo; umbella uniflora; spatha 3—4.3 cm. longa, parte inferne tubulosa 1.3—2.9 cm. longa, extremitatibus plerumque fenestratis; pedicello 2—3.5 cm. longo; flore erecto 5—6 cm. longo; ovario 3 x 4.6 mm.; tubo tepalorum 2 cm. longo; segmentis sepalorum spathulatis vel anguste ovatis 3.5—4 x 1—1.3 cm., ad apicem acutis; segmentis petalorum spathulatis 3.5—4 x 1 cm., ad apicem acutis; staminibus in ordinibus 2 dispositis, ordine uno 1.3—1.5 cm. longo, ordine alio 1.8—2.3 cm. longo; stylo 4 cm. longo; stigmatate trifido, lobis linearibus 6—8 mm. longis.

Harold N. Moldenke

THE PERFECT MALLOW MARVEL

E. SAM HEMMING, *Maryland*

About fifty years ago, while herbaceous foreman at the Meehan Nurseries in Germantown, Pennsylvania, the late Ernest Hemming decided to attempt the improvement by hybridization of the native marsh Mallow or hardy *Hibiscus*. Using the three wild forms *Hibiscus moscheutos*, *Hibiscus palustris*, and *Hibiscus coccineus*, he made numerous crosses and recesses. He produced a strain of seedling Mallows that were eventually marketed under the name of MEEHAN MALLOW MARVELS. These were exhibited at the Jamestown Exposition and were received favorably by the gardening public. The color of the flowers ranged from pure white through the shades of pink to dark red, the size of the flower was increased so that in some plants they were nine inches in diameter. The foliage varied tremendously from entire leaves to deeply cut leaves, and from coarse hairy leaves as in *Hibiscus moscheutos* to shiny dark green leaves.

In spite of the favorable reception of the plants it was Mr. Hemming's opinion that the plants had been marketed prematurely and that further improvement was both possible and desirable. In the premature marketing there were two mistakes made; none of the plants were perfect in that (a) all of them had at least one undesirable characteristic, and (b) because of the slowness of vegetative reproduction they were sold as a seedling strain and not as ramets of clones.

When Mr. Hemming established the Eastern Shore Nurseries, Inc., Easton, Maryland with his son to carry it on, he decided to take up the problem of further improvement in the Mallow. The perfect plant he sought, must have all four of the following characteristics: (1) a flower of beautiful color, (2) a flower with overlapping petals and opening flat, (3) rich shiny green foliage with no pubescence, and (4) a medium sized plant about 4 feet high without coarse habit. Assembling a number of his former plants he started crossing and recrossing, discarding all plants that did not have what he desired until he finally succeeded in getting the plant that met his qualifications about ten years ago [See Fig. 17]. Since that time the plant has been propagated until there is now a sufficient quantity for the present offer to the public. The plant has been patented, (plant patent #835) and has been named ANNIE J. HEMMING and will be introduced to the public in the January 1952 issue of BETTER HOMES AND GARDENS.

The new Mallow is an herbaceous perennial that bears large, brilliant, luminous red flowers about six inches in diameter and has overlapping petals with the flower opening flat. The flowering period is very long; starting to bloom early in July, it continues through August and September and in Maryland well into October. The foliage is a rich dark green almost like the shrubby tropical forms. A single two year

plant bore by actual count 250 blooms in one season. Each flower lasts a day, and while it is not a cut flower, the stems can be cut and put in water and a succession of buds will open.

The plant seems to be quite hardy in Maryland where it has been grown without protection. It has withstood a temperature of 2° F. below zero. In the colder sections of the country it might be safer to protect the plant by mounding as is done with a Hybrid Tea Rose. It is presumably as hardy as a rose.



Fig. 17. Hybrid *Hibiscus*—the perfect Mallow Marvel, ANNIE J. HEMMING. (Plant Patent No. 835).

The plant is best used in borders and given plenty of room, a spacing of at least five feet, and a single plant gives you a wonderful display of color. The plant will grow in almost any soil and location, in fact the parents were marsh plants, but while they will grow in marshy spots and near the seashore, yet they respond best under good garden soil conditions. A beautiful plant, it will stand considerable abuse and neglect and is quite tough; it is very easy to transplant successfully. This Mallow will grow and last many years under ordinary garden care and give annual shows of gorgeous bloom.

A NEW HYBRID HIBISCUS

W. R. BALLARD, *Maryland*

The Mallow Marvels are showy summer blooming perennials with large flowers somewhat resembling hollyhocks. There is quite a range of color from white through various shades of pink to deep red. Until the advent of the Japanese beetles these hibiscus were relatively free from injurious pests but this new enemy seems to be very fond of the hibiscus flowers particularly those of the lighter colors. Fortunately these beetles have now greatly decreased in numbers in the vicinity of Washington, D. C.

The mallows are slow to start growth in the spring. Eventually they make sizable plants with a heavy fleshy root system which makes them difficult to transplant. To propagate desirable forms it is necessary to divide the clumps and this is a slow and laborious process.

Nurserymen generally grow the Mallow Marvels from seed and sell them only in assorted colors. The purchaser cannot therefore be assured of the color he may want, excepting the new Mallow Marvel, ANNIE J. HEMMING, described in the preceding article. It would be a distinct advantage if varieties could be developed which would come true from seed.

These hibiscus have a place in the perennial border as specimens or as a background for lower growing sorts. They bloom in midsummer when the border is often lacking in color. While the flowers are similar in form to those of the hollyhock, the effect of the plants in the garden is quite different. The tall stately habit of the hollyhock is replaced by the wide spreading plant of the Mallow Marvels. The hollyhock has largely disappeared from many gardens because of its susceptibility to the rust which gives the plants a disreputable looking appearance soon after blooming.

Some years ago some one gave me a few seeds of *Hibiscus coccineus*, the Southern scarlet form and one of the parents of the Mallow Marvels. I was told that this species would be hardy if the seedlings could once get established. This has proved true and I have had them blooming in my garden for several years. Incidentally the Japanese beetles have not bothered them appreciably.

I had never seen the rich red color of *H. coccineus* in the Mallow Marvels and wondered if it could not be developed. I happened to have a pure white Mallow Marvel with no color markings and it occurred to me that this would be a good place to start. Accordingly crosses were made between these two forms. When the seedlings bloomed the flowers were of a pure deep red but not exactly a duplicate of the species. However, the seedlings were remarkably uniform in character and apparently had acquired considerable hybrid vigor [Fig. 18]. The flowers were

larger than either parent and the plants were very vigorous in growth. The plants are growing on the edge of a marsh where there is a constant supply of moisture and get to be about seven feet in height. Under ordinary garden conditions they would probably not get so high.

It is possible that a nearer approach to the color of the Southern species could be secured from the second generation seedlings but there



Fig. 18. *Hibiscus* breeding:—Increased size due to hybrid vigor in hybrid *Hibiscus* (center), obtained by crossing *Hibiscus coccineus* Walt., ($5\frac{1}{2}$ inches across face) ♀ (right), with white-flowered hybrid *Hibiscus* (Mallow Marvel) ♂ (left).

has not been time to determine this possibility. However, the hybrid makes a striking appearance, and the fact that it comes practically true from seed in the first generation makes it easy to reproduce it simply by growing plants from seed secured by crossing the two parents.

CHINESE HIBISCUS ON THE GULF COAST

WALTER C. HAVA, D.D.S., *Waveland, Mississippi*

The Chinese *Hibiscus* (*H. rosea sinensis*), and more recently the Hybrid *Hibiscus*, for years have graced many of our deep southern gardens. Many of our older well established plants are of the more common varieties, while the younger ones are predominantly the hybrids. With the introduction of the single and double hybrids, with their flowers of vivid color and beautiful shapes, and a better knowledge of their cultural requirements, garden enthusiasts are becoming more hibiscus conscious.

Ordinarily, this plant is very well suited to this locality. We have very nearly a sub-tropical climate, having winters with a very few light freezes of short duration. There are winters when large well established plants in protected locations, retain most of their foliage. But this last winter proved a great surprise to us. We had more freezes than usual and they were of greater intensity. One of them was a record breaker. We did not believe that down here the temperature could drop to 12 degrees F. and lower. Consequently most gardeners were caught with no provisions for protecting their hibiscus. Naturally the loss was heavy. Possibly the rapid elevation of the temperature to 65 degrees F., with the hot sun shining on these frozen plants, contributed greatly to their loss.

We have a peculiar condition existing here. Our communities are strung out for about 75 miles along the Gulf of Mexico. The winter temperature varies sometimes as much as 7 to 10 degrees depending on your proximity to the shore line. There is a belt of about one-half mile along the beach, in which the weather is much milder than it is further back. The water seems to "temper the temperature." Gardeners in this belt experienced less loss than did those further back from the beach.

I am very much indebted to those gardeners who so kindly made an inventory of their *Hibiscus* losses. So as to be more accurate, we purposely waited until the middle of May to make this check. They made the following report. Most of the small plants left out in the garden perished. Many of the older plants, seemingly dead, are beginning to sprout at ground level. Many gardeners impatiently dug up their plants

too early, believing them dead. With a little patient waiting, they would often have been rewarded by seeing their hibiscus begin to grow again. It is lamentable that our greatest loss was among the newer hybrids. Our City Park and neutral grounds suffered a loss of about 75%. The Parkway Commission had just entered into an intensive program of hibiscus planting, with plans to increase it this year. It is to be hoped that their unfortunate loss will not discourage them. Winter before last, we enjoyed hibiscus blossoms for 11 months of the year. Those gardeners along the Gulf Coast, with large plantings of hibiscus, report about a 30% loss. Blossoms will be delayed this year, but with so much new wood, we should have more flowers.

Plants left in the garden over winter can be protected very effectively by heaping a mound of earth around their trunk. The height of the mound is determined by the size of the plant, 12 inches being sufficient for the average one. Heavy mulches of leaves, saw dust, rags or paper, etc., seem to do more harm than good. Our very frequent winter rains keep these materials much too damp. The cone of earth dries off quickly. Too much moisture during a period when these plants cannot use it, causes more loss than does very cold weather. The rule that I follow, is to limit moisture for plants that have shed their leaves, but allow more to those that retain their leaves. I had the unfortunate experience of losing many of my well started potted young plants. We made an error in placing the pots on a paved part of the hot house floor, in three inches of damp saw dust. The cement prevented the excess of moisture from draining off. Experience is a good teacher, but too often a very expensive one. I shall not forget this lesson. Hibiscus intended to be placed in the hot house over winter, and which are to be planted in the ground are prepared in the early fall for their transfer. A long narrow sharp spade is used, one made for digging trenches for sewer pipe. The spade is sunk straight into the ground for about 12 inches deep, describing a circle 6 inches away from the trunk. This distance is varied, depending on the size of the plant. This operation severs the longest roots, and a more concentrated root system develops in this smaller circumscribed area. Shock is therefore minimized when the plant is finally taken up, for transfer to the winter quarters. After balling, the small ones are placed in gallon cans, the larger ones in 5-gallon cans and the still larger ones in hampers that have been lined loosely with wax paper. Water should be used judiciously.

Cutting material is obtained from these plants just before they are balled. Terminal shoots are pruned back enough to obtain one or more cuttings with proper eyes. These branches would wither anyway and also be in the way in the hot house. This is a splendid opportunity to get valuable rooting stock. Cuttings are again obtained in early summer. Some of the large center branches are removed to prevent foliage from becoming too dense. These heavy wood branches are fine for cuttings. They are prepared in 10-inch lengths similar to the lighter wood from terminal branches, but a stronger rooting hormone is used. Hormodin #3 or Rootone #10 is necessary for this heavy wood, while the #1 hor-

mone powders are used on the lighter woods. I have a preference for the heavy cuttings. While they root more slowly, and do not produce leaves as fast as the light wood, in the same length of time we have a larger plant with a more abundant root system.

I have found it advantageous and well worth the additional effort to place each cutting in an individual can. Holes are punched in the sides and bottom with a beer can opener. This gadget facilitates the hole punching procedure. Something like a soup or tomato can is of ample size. The rooting medium is made up of equal parts of loam, coarse sand, peat and leaf mold. The use of this rooting mixture together with the can, has the following advantages: the cuttings can be left in the cans until it is convenient to set them out, the roots can develop without danger of crowding other cuttings, and roots with their ball are not disturbed in the least when transplanted. I have left them in cans for 6 months until the roots protruded through the holes. During this time they are fed with Descanso plant food, one teaspoonful to the gallon of water; or they are fed modified cotton seed meal. Both of these nutrients are acid in reaction. I have observed that hibiscus do better in a pH 6.5 soil. Those near the rose bushes seem to grow faster than do those near the chrysanthemums. When we are ready to remove the rooted cutting from its can, we cut the can down along its side, and half way around the bottom. A small pair of shears is used to do this. When the sides of the can is spread open, the ball comes out intact. The present day cans are so thin that a little rusting makes them easy to cut. With a solid ball to set out, we obviate the danger of planting too deep.

Other standard rooting media are used, but we have a greater loss after they are set out. In cans, vermiculite remains too damp. We make a wooden frame and tack a piece of scrap copper screen wire to the bottom. This allows for good drainage.

In winter, we hasten the rooting by sinking the cans into a three or four inch bed of fresh horse manure placed in the bottom of the rooting frame. The chemical changes that take place in the manure, produce heat, and this bottom heat accelerates the root formation. Then again, after a few months, this manure is well rotted, and is ready for use in the garden.

Our newly potted cuttings are gradually subjected to sunlight until finally they enjoy the hottest weather and a full day's sun. They need frequent watering and well drained soil. Finally, after 8 to 10 months of watchful waiting and tender care, comes the pay off. We see a bud appear and watch it grow day by day until it bursts forth in all of its beauty. Our little cutting has its first bloom. It is a great satisfaction, and we feel that our efforts have been well rewarded.

REPORT OF SOUTHWEST REGION

PHILIP G. CORLISS, M.D., *Southwest Regional Vice President*
Somerton, Arizona

A joint meeting of the Southwest Regional group of the American Plant Life Society, the Bulb Society, and the Region #7 group of the Hemerocallis Society was held in Arcadia, California, on Saturday, May 26, 1951. More than one hundred members from the three societies gathered to enjoy the many features of the program.

The meeting began with a tour of the extensive exhibition gardens of Mr. Carl Milliken. Many named varieties of hemerocallis were in bloom. The visitors found their way to a large seedling bed, where one seedling in particular aroused much excitement on account of the brilliant striped throat resembling the rays of a glorious setting (or rising) sun.

More than twenty cars formed a caravan which drove the short distance down U. S. Highway #66 to the new Los Angeles County Arboretum, where Mr. Quinn Buck, regional director of The Hemerocallis Society, had moved his extensive daylily plantings. Although considerable interest was shown in other plants seen in the glasshouses, the highlight of this stop was to see the results of colchicine treatment of hemerocallis. Mr. Buck treats named varieties, and the best example of the polyploid growth resulting from the colchicine was in Dr. Stout's variety, SOUDAN.

The party next split into three sections. One group went to the daylily gardens of the Grahams in El Monte. Bloom was at peak here, the best shows being put on by vigorous rows of Russell's QUOTE ME and PURPLE WATERS.

The second group went to the 160 hilly acres in Monrovia that comprise the horticultural wonderland of Dr. Lux. The United States Department of Agriculture and other organizations have sent plant material from all over the world to Dr. Lux for this testing ground where frost is unknown. It has been estimated that there are more than 15,000 varieties of plant species growing in this amazing "garden." It covers a hillside, with terraced paths so steep it takes a good hiker to negotiate them. We were especially interested in the hundreds of *Amaryllis* seedlings blooming on the precipitous slopes. In his breeding, Dr. Lux seems to have come closer to pure rose shades than most hybridizers, and the members who were fortunate enough to see his hybrids were greatly excited and many begged pollen from huge flowers that caught their fancy. The wooded hills of Dr. Lux's "garden" might seem to the casual visitor to be not unlike any neighboring hills, but the botanist is thrilled to find that every flower, bush, or tree, is something unusual and generally unknown to him.

The remainder of the members gathered under the huge live oaks

at Mr. J. N. Giridlian's Oakhurst Gardens, where they were later joined by the rest of us for garden tours and picnic suppers. I shared the generous baskets brought by several of our members, notably Miss Charlotte Hoak, Horticultural Editor of Golden Gardens. Mr. Giridlian stoked up a portable barbecue wagon and distributed delicious frankfurters and rolls.

After dinner we enjoyed Kodachrome slides projected in the same oak grove. It grew rather chilly, and the barbecue wagon was moved around the grove, providing pleasant warmth.

Our thanks are extended to Mr. Giridlian and The Bulb Society for their hospitality; the meeting was thoroughly enjoyable and I think all of us benefitted from it.

PLANT LIFE LIBRARY

FORESTRY IN FARM MANAGEMENT, by R. H. Westveld and Ralph H. Peck. 2nd ed. revised by R. H. Westveld. John Wiley & Sons, 440 4th Ave., New York, 16. 1951. pp. 340. Illus. \$5.00.

This important contribution represents "thoroughly revised information on new equipment and techniques for managing farm forests and utilizing their products — with emphasis on the principles of timber growing." The fourteen chapters are devoted to forest trees in a balanced agriculture, the economic and biological basis of growing tree crops, improvement and perpetuation of farm forests, establishment of new farm forests, measuring values of farm-forest products, and volumes and growths of farm forests, making trees into wood products, marketing farm-forest products, best use of wood on farm, management for special products, how farm forests aid wildlife, farm-forest plans and records, and aids to owners of farm forests. The volume concludes with a valuable appendix and an index. This book is highly recommended.

INSECT CONTROL BY CHEMICALS, by A. W. A. Brown. John Wiley & Sons, 440 4th Ave., New York. 1951. pp. 817. Illus. \$12.50.

This up-to-date reference book on the subject indicated is indispensable to all who are interested in the theory and practice of insect control.

In the introductory chapter the insecticides of the 20th century are characterized, and the following chapters are devoted to the chemistry of insecticides, and their toxicity to insects; the pharmacology of poisons for insects; equipment for the application of insecticides, including also application from aircraft; toxicity and hazards to man and domestic animals, and to plant growth; chemical control of insects feeding on plants, and those affecting man and animals; and finally, insecticides and the balance of animal populations.

This important book is highly recommended.

INTRODUCTION TO AGRICULTURAL BIOCHEMISTRY, by R. A. Dutcher, C. O. Jensen and P. M. Althouse. John Wiley & Sons, New York & London. 1951. pp. 502. Illus. \$6.00.

This attractive text "has been written on the assumption that it will be suitable for students with sound training in inorganic and organic chemistry," and "that it will serve as a general reference book for students who are interested in the underlying chemical principles affecting plant and animal growth." Part 1 is concerned with general considerations. Part 2 is concerned with the essential biochemical processes during seed germination and subsequent plant growth. Part 3 is concerned with the use of plants as foods for animals, particularly, the biochemical processes of digestion, metabolism and growth. Modern dietary requirements of man and domestic animals are also considered in the discussions.

This important book is highly recommended.

ELEMENTS OF PLANT PROTECTION, by Louis Pyenson. John Wiley & Sons, 440 4th Ave., New York. 1951. pp. 538. Illus. \$4.96.

This important, copiously illustrated work "brings together information on all plant pests—insects, disease-producing organisms, rodents, birds and weeds. It discusses their nature and control practices in a simple, concise fashion. Technical jargon has been eliminated whenever possible." It should appeal to both student and practical plantsman—farmer, horticulturist—as "interesting and informative reading and a valuable reference." It is very highly recommended.

THE MEASUREMENT OF LINKAGE IN HEREDITY, by K. Mather, 2nd ed. John Wiley & Sons, 440 4th Ave., New York 16. 1951. pp. 149. \$1.75.

The objective of this valuable text is to bring to the notice of the geneticist the desirability of employing such refined statistical methods as are now in common use in such branches of biology as agronomic experimentation, and to provide the necessary instruction for their use. The subjects covered include two class segregations, information and the planning of experiments (I & II), the determination and estimation of linkage, combined estimation and testing heterogeneity, disturbed segregations, human genetics, the estimation of gene frequencies, and symbols and formulae. A brief bibliography and an index are also provided. This concise text will be a very valuable addition to the geneticist's library.

CYTOLOGICAL TECHNIQUE, by John R. Baker. 3rd. ed. John Wiley & Sons, 440 4th Ave., New York 16. 1950. pp. 221. Illus. \$1.75.

This is an excellent brief presentation of the "principles and practice of methods used to determine the structure of the metazoan cell." In addition to the introduction there are chapters on general remarks on fixation, simple fixatives, fixing mixtures, microtomy, staining, mounting, methods for chromosomes, mitochondria and the Golgi element, a bibliography and an index. This text is outstanding on account of the

author's facility in presenting background material dealing with the chemistry of mordanting, and staining. This concise handy reference volume is very highly recommended.

SOIL AND FRESHWATER NEMATODES, by T. Goodey. John Wiley & Sons, 440 4th Ave., New York. 1951. pp. 390. Illus. \$7.00.

This up to date, comprehensive book by one of the world's authorities on nematology on the "free living nematodes found in nature in decaying plant tissues, in soil and humus, in fresh water habitats and sometimes in special association with insects" represents a land mark. It is apparently the only single book that summarizes the knowledge on this subject. It gives "a concise description of each genus considered and provides a clear, helpful illustration of each" and also gives facts of biological interest including food habits.

THE CHROMOSOMES, by M. J. D. White. 4th ed. John Wiley & Sons, New York. 1950. pp. 124. Illus. \$1.50.

We welcome this 4th edition of Dr. White's well known concise text on chromosomes. The chapters of the book are devoted to (1) the resting nucleus, (2) the general outline of mitosis, (3) special problems of mitosis, (4) the general outline of meiosis, (5) special problems of meiosis, and (6) chromosomes and evolution. The book concludes with a glossary of terms, a bibliography and an index.

THE PLANT DOCTOR, by Cynthia Westcott. 3rd ed. J. B. Lippincott, E. Washington Sq., Phila. 1950. pp. 231. Illus. \$3.00.

This is a revised edition of a well-known and much appreciated book on the control of the common garden enemies—"bacterial, fungous and virus diseases, physical injuries and those caused by environment and by chewing and sucking insects, nematodes and mites"

The first ten chapters are on a calendric basis for pest control in the Northeastern States, including pests common to other sections of the United States. Then follow chapters on troubles in the Middle West, Southeast, Southwest, California and the Northwest; an alphabetical miscellany, and an index.

This is an excellent popular book on the control of garden pests, and will have a wide appeal to the gardener.

GENETICS IN THE 20TH CENTURY, edited for the Genetics Society of America by L. C. Dunn. Macmillan Co. New York. 1951. pp. 634. \$5.00.

This attractive volume is "a compilation of the invitation papers presented at the program of the Golden Jubilee of Genetics at Ohio State University, Columbus, Ohio, Sept. 11—14, 1950. . . . The primary purpose was to survey the progress of the first fifty years of genetics and to exemplify the status of some of its problems today." The 26 chapters cover the entire field of genetics by outstanding American and European authorities. This is a *must* work for all interested in genetics.

FOUNDATIONS OF BIOLOGY, by L. L. Woodruff and G. A. Batsell. 7th ed., Macmillan Co., 60 Fifth Ave., New York. 1951. pp. 719. Illus. \$5.50.

This 7th enlarged, profusely illustrated edition of an outstanding text on biology, prepared by Dr. Batsell at the request of the late senior author, without doubt is among the best concise treatises on the subject. The 35 chapters dealing with plants and animals provide a stimulating survey course of the entire field of biology, including structure, physiology, genetics, evolution and classification. It is a text that the teacher, college student and others interested in the field will welcome. It is highly recommended to all readers of Plant Life.

TAXONOMY OF VASCULAR PLANTS, by George H. M. Lawrence. Macmillan Co., New York. 1951. pp. 823. Illus. \$7.95.

We have long been waiting for just such a book, and this stimulating work will surely receive a warm reception. It is "an outgrowth of the author's experience as a research taxonomist and as a teacher." Dr. Lawrence breaks new ground in dividing his treatise into two parts. One part presents the "more academic and theoretical considerations of taxonomy, supplemented by explanatory chapters of the practical fundamentals found to be essential to a minimum working knowledge of the science." The second part consists of "a systematic enumeration of 264 families of vascular plants known to grow as indigens or exotics in North America." This second part is supplemented by "an appendix providing an illustrated glossary of the botanical terms used throughout the text."

This is undoubtedly the best text on the subject that has appeared up to the present, and is recommended to all who are interested in the taxonomy of vascular plants.

HAMMOND'S COMPLETE WORLD ATLAS, by C. S. Hammond & Co., New York. New 1950 Census Edition. New York. 1951. pp. 376. \$5.00.

This attractive world atlas, only $6\frac{3}{4}$ by $9\frac{3}{4}$ inches in size, provides a handy reference volume that the plantsman may keep in an ordinary book shelf with other required reference books. The large-scale up-to-date double-spread maps in different colors represent a distinct achievement in atlas making. The volume also includes a glossary of geographical terms, an illustrated gazetteer of the United States and Territories, and an index of cities and towns of the world.

PLANT GROWTH SUBSTANCES, edited by Folke Skoog. University of Wisconsin Press, 811 State St., Madison, Wisc. 1951. pp. Illus. \$6.00.

This important volume is edited by one of the 40 contributors. The papers were presented at a symposium at the University of Wisconsin, Sept. 5—7, 1949, and include papers from most of the outstanding contemporary workers in the field of plant growth substances. The articles

are grouped under (1) plant growth substances, (2) growth substances in plant metabolism, (3) tissue responses to growth substances, (4) practical application, (5) growth substances in vegetative development, (6) growth substances in reproductive development, (7) growth substances in pathological growth, and (8) vitamins and amino acids as growth factors. This is an indispensable reference book for all interested in plant science research.

MINERAL NUTRITION OF PLANTS, edited by Emil Truog. Univ. of Wisc. Press, Madison, Wisc. 1951. pp. 469. Illus. \$6.00.

This book is a compilation of 18 articles on mineral nutrition of plants by 22 authors from various research institutions of the United States, Hawaii and Sweden. It was edited by one of the contributors. The papers were presented at a symposium held at the University of Wisconsin. The articles are grouped under (1) mineral nutrition of plants, (2) physico-chemical and biological factors affecting nutrient availability in soils, (3) mechanism of entry and translocation of mineral nutrients in plants, (4) some field problems in plant nutrition, (5) role of minerals in plant nutrition, and (6) modifying influences of various environmental factors upon mineral nutrition.

These papers represent the "latest information, both theoretical and practical, associated with mineral nutrition of plants."

HOW TO LANDSCAPE YOUR GROUNDS, by Loyal R. Johnson. 2nd ed. A. T. de la Mare Co., 448 W. 37th St., New York. 1950. pp. 257. Illus. \$3.50.

The first 16 chapters of this attractive book are concerned with the principles and practice of landscape gardening—planning before planting, locating the house, architectural features of the garden, walks, drives and entrances, lawns, trees and shrubs, flower gardens for gay color, rock gardens, wild gardens, soil improvement, select list of (1) shrubs, (2) acid soil plants, (3) trees, and (4) vines.

Chapter 17 is devoted to planting plans and keys for the various regions of the United States.

This valuable text is highly recommended.

PROBLEMS OF CYTOLOGY AND EVOLUTION IN THE PTERIDOPHYTA, by I. Manton. Cambridge Univ. Press, American Branch, 51 Madison Ave., New York. 1950 pp. 316. Illus. \$8.50.

Written in beautiful English and with a minimum of scientific jargon, this authoritative work is without doubt one of the most outstanding contributions ever reported in the field of karyo-systematics and evolution. The thorough treatment, based on the foundation that "what cannot be photographed is not used as evidence," is bound to influence very greatly not only the thinking about the subject treated, but will also serve as an ideal toward which others will strive in the future. "She first surveys the growth of knowledge of evolution and heredity since Darwin and Mendel, and describes and illustrates a few particular ex-

amples to explain the methods followed and the essential concepts and technical terms to be used. . . . The main theme is a comparison between evolutionary processes as revealed by cytology in an ancient and a modern group of plants. For the modern group (*Cruciferae*) the author draws upon published work; but for the ancient group (*Pteridophyta*) this book is the sole authority." Dr. Manton's book is of first importance not only to the specialist in the field of the *Pteridophyta*, but also to the systematist and student of evolution. It is a book that is very highly recommended.—*H. P. Traub*

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 150.]

long as the perianth segments, the segments linear or lanceolate-linear, acute, reflexed; filaments filiform; anthers ovate; style filiform. Tropical Africa.

Haemanthus germanianus J. Braun & K. Schum., in Mitt. deut. Schutzgeb. 2: 145—146. 1889.—Bulb globose; leaves about 7, arising immediately from the rhizome at the same time as the flowers, long-petiolate, oblong, attenuate-acuminate, fleshy (but in drying thin-membranous, hyaline), attenuate into the petiole at the base, purple-speckled, the larger veins slender, the transverse veins oblique; peduncle elongate, unspotted, from the center of the bulb; umbel many-flowered, showy; spathes lanceolate, membranous, straight; pedicels long; divisions of the perigonium spreading, the tube $\frac{1}{5}$ as long as the segments; stamens surpassing the perigonium. Cameroons.

Haemanthus kundianus J. Braun & K. Schum., in Mitt. deut. Schutzgeb. 2: 156. 1889. Bulb globose, stature of the preceding; leaves very long—petiolate, oblong, very obtuse, shortly attenuate into the petiole at the base, the larger veins slender, the veinlets oblique; umbel globose, pedunculate; flowers pedicellate; tube of the perigonium longer than the ovary, the segments twice as long as the tube; stamens greatly surpassing the perigonium. Cameroons.

Haemanthus leucanthus Miq., in Jour. Bot. Neerl. 1: 33—34. 1861.—Leaves two, somewhat longer than the scape, not sheathed, obovate-oblong or subspathulate, spreading-ciliate, fleshy-herbaceous, green; scape cylindrical-compressed, whitish-greenish, glabrous; segments of the involucre 5, ovate or narrower, whitish, green-nerved, retrorsely ciliate except at the base and apex, equaling the larger stamens; umbel many-flowered, flowers sessile; lobes of the white perigonium linear, connivent, tuberculate at the somewhat incurved apex, shorter than the stamens. Cape of Good Hope.

Haemanthus bequaertii De Wild., in Pl. Bequaert. 1: 44—45. 1921.—Herbaceous, bulbous, up to 2 cm. wide at the base; roots velutinous, to 4 mm. thick; leaves 2 or 3, petiolate, the petiole 18—23 mm. long, sheathing at the base, the blade elliptic, 12—13 cm. long and 5.5—8 cm. wide, with 7 or 8 non-furcate lateral veins, rounded at the base or

obtusely cuneate, short-acuminate at the apex; inflorescence lateral, the peduncle about 34 cm. long; umbel about 15-flowered, 12 cm. broad; flowers carmine-red, pedicellate, the pedicel 14—16 mm. long; tube of the perianth 12—13 mm. long, the segments linear, 1-nerved, 25—38 mm. long and 1 mm. wide; ovary subglobose, about 3 mm. broad; filaments about 30 cm. long. Belgian Congo.

Haemanthus radcliffei Rendle, Jour. Linn. Soc. Bot. 37: 223—224. 1905. Glabrous herb, from a thick root-bearing rhizome; leaves 3 or more, long-petiolate from a broadly sheathing base; petiole winged; blade oblong-elliptic, obtuse at the apex, gradually narrowed into the petiole at the base, papery in drying; veins regularly joined to the transverse veinlets, 6 conspicuous on each side; scape central, thick at the base, sheathed with short membranous leaves; involucrel bracts scarious, greatly reflexed; umbel globose, about 20-flowered; pedicels longer than the bracts; tube of the perianth slender, cylindric, shorter than the segments, the segments linear-lanceolate, acute, spreading, . . . reflexed, rose, 5-nerved; filaments surpassing the segments. Rhizome 3 cm. long, 1.5 cm. thick; petiole about 20 cm. long, flattened, 5 mm thick, merging into the blade that is about 20 cm. long and 5 cm. wide; scape subequaling the petiole; bracts 2.5 cm. long; umbel about 13 cm. in diameter; pedicels about 3.5 cm. long; tube of the perianth 1.5 cm. long, about 1 mm. in diameter, the segments 3 cm. long, scarcely 5 mm. wide; filaments to 4 cm. long, anthers 1.5 mm. long.

Haemanthus cyrtanthiflorus C. H. Wright, Jour. Linn. Soc. Bot. 37: 529—530. 1906.—Differing from the remaining species of the genus in the broad oblong segments of the perianth which are much shorter than the tube. Bulb ovoid, drawn out into a long neck at the apex, furnished at the base with an obliquely descending rhizome 3 cm. in diameter; leaves elliptic, attenuate at the base and apex, at first minutely furfuraceous, finally glabrous, about 23 cm. long, 7.5 cm. wide, membranous, the lateral veins 7—10 on each side, inconspicuous; petiole about 18 cm. long; scape lateral, about 30 cm. long, glabrous, about 12-flowered; spathes membranous; pedicels 2.5 cm. long, slender; perianth red, the tube 3.8 cm. long, subcylindric, the lobes oblong, obtuse, cucullate at the apex, the exterior ones 12 mm. long and 4 mm. wide, slightly longer than the interior ones; stamens inserted in the throat of the corolla; filaments flattened, long-triangular, 6 mm. long; anthers 3 mm. long; ovary subglobose, 4 mm. long, glabrous; berry subglobose, 18 mm. in diameter, 2-seeded; seeds 10 mm. in diameter.

Haemanthus eetveldeanus De Wild., & Th. Dur., in Ann. Mus. Congo, Ser. II. i. I. 56. 1899.—Rhizome thick, perpendicular, compact. brown, white within; leaves 4, dark-green, long-petiolate, the petiole semi-terete, 16—22 cm. long, dilated at the base; blade ovate-elliptic, attenuate at the base and apex, 16-37 cm. long and 7—8 cm. broad; veins about 11—13 on each side; scape central, long-pedunculate, the peduncle about 34 cm. long; umbel many-flowered, about 12 cm. broad, globose,

the pedicels about 40 mm. long; perianth rose, the tube cylindric, 7—8 mm. long, the segments ovate-elliptic, 5-nerved, about 22 mm. long and about 7 mm. wide; filaments rose, 22—30 mm. long; anthers about 2 mm. long. Belgian Congo: Region III, in wet forests near Eloungou, November 1896 (Alf. Dewevre, collector).

Haemanthus cabrae De Wild. & Th. Dur., in Ann. Mus. Congo, Ser. II. i. I. 56. 1899.—Rhizome thick, globose, 15—20 mm. broad, brown, white within; leaves 2 or 3, yellow-green, long-petiolate, the petiole semiterete, 10—13 [cm.] long, slightly dilated at the base; blade ovate-elliptic, attenuate at the base and apex, 10—16 cm. long and 3.5—6 cm. broad; veins 9 on each side; scape central, long-pedunculate, the peduncle about 25 cm. long; umbel many-flowered, about 11 cm. broad, globose, the pedicels 20—22 mm. long; perianth rose, the tube cylindric, 8—9 mm. long, the segments linear-elliptic, acute, 3—5-nerved, about 20 mm. long and 3 mm. wide; filaments rose, about 30 mm. long; anthers brown?, about 2 mm. long. Belgian Congo: Region V, south of Boma-Vonde, 1896 (Captain Cabra, collector).

Haemanthus (Nerissa) ceciliae Baker, Kew Bull. 28. 1906.—Very close to *H. zambesiacum* Baker, differing in the longer tube of the perianth and the segments of the limb twice as long as the tube. Bulb large; leaves oblong, obtuse, attenuate at the base, membranous, glabrous, the primary veins 9 or 10 between the midrib and the margin, the intermediate veinlets close together, oblique; peduncle stout, lateral, conspicuously red-brown below, spotted; umbel globose, dense, 5—6 inches in diameter; valves of the spathe many, lanceolate, reflexed, 3—3.6 cm. long; pedicels 2.4—3 cm. long; perianth deep red, the tube cylindric, 8—9 mm. long, the segments of the limb linear, 1-nerved, twice as long as the tube, erect-spreading in the expanded flower; stamens slightly longer than the limb, the filaments red, the anthers oblong, small, loose.

Haemanthus (Gyaxis) somaliensis Baker, Kew Bull. 227. 1895.—Leaf-bearing stem shortly developed; leaves three, membranous, oblong, growing rapidly, often anastomosing, cohering; scape elongate; bracts oblong, membranous, persistently ascending; pedicels elongate; tube of the perianth cylindric, the lobes subulate, ascending, equaling the tube in length; stamens longer than the lobes of the perianth; filaments filiform, reddish; anthers small, oblong, yellow, fruit globose, glabrous. Leaves appearing with the flowers, 6 inches long, 2 inches wide; scape 5—8 inches long; bracts 3 cm. long; corolla-tube 6—8 mm. long; filaments 1.8 cm. long; fruit about the size of a pea.

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THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

THE AMERICAN PLANT LIFE SOCIETY

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PLANTS RECEIVING APLS AWARDS IN 1951

The following awards were made during 1951.

Crinum amoenum Roxb. Award of Merit (A. M.), July 17, 1951. Presented for trial by Wyndham Hayward. This is one of the most satisfactory *Crinums* for pot culture.

Zephyranthes clintiae Traub. Award of Merit (A. M.), Aug. 6, 1951. Presented for trial by Mrs. Morris Clint. This is an excellent pot plant.

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 168.]

Haemanthus longipes Engl., Bot. Jahrb. 7: 332. 1886.—Leaves lanceolate, plainly narrowed into a winged petiole half their length, acuminate, acute; peduncle shorter than the leaves, many-flowered; pedicels slender; segments of the perianth equaling the funnel-form tube, lanceolate; filaments narrowly linear, acute, mucronate; anthers linear; ovary obovoid, truncate; fruits cinnabar-red. Petiole 10—15 cm. long; leaf-blade 20—30 cm. long, 6—8 cm. wide, the midrib 5—6 mm. thick, recurved; peduncle about 20 cm. long, 6 mm. thick; pedicels 4.5 cm. long, ovary 2—3 mm. long; perianth hyacinth-colored, 2.5 cm. long, the segments about 1.2 cm. long, 3—4 mm. wide; filaments 2.5 mm. long, 1 mm. wide, adnate to the perianth-tube.

Haemanthus goetzei Harms, in Engl. Bot. Jahrb. 30: 276. 1902.—Bulb globose, thick; leaves not yet developed in our specimen; peduncle lateral, surrounded at the base by sordid-violet sheaths, erect, rather thick; bracts obovate or oblong or oblanceolate, sordid-violet; umbel many-flowered, dense; pedicels 2—3 times longer than the perianth-tube, the perianth-segments 2—4 times longer than the tube.

Anoiganthus gracilis Harms, Engl. Bot. Jahrb. 30: 276. 1902.—Corm oblong, narrowed at the apex into an elongate neck; leaves not yet plainly developed, linear; scape glabrous, bearing a 2-flowered umbel at the apex; bracts 2 at the base of the umbel, linear, erect or spreading with an acute sinus; one pedicel longer than the other; perianth-tube funnel-form, the segments 6, lanceolate, about equaling the tube; stamens 6, inserted at the margin of the tube; filaments short; anthers oblong, dorsifixed.

Haemanthus longitubus C. H. Wright, in Jour. Linn. Soc. Bot. 37: 114—115. 1905.—Related to *H. multiflora* Martyn, differing in the much longer tube of the perianth. Leaves elliptic, shortly and abruptly acuminate, thin-membranous, 6 inches long, 2½ inches wide; petiole 1¼ inches long; sheaths 3 inches long, spotted; peduncle lateral, 8 inches long, [umbel] many-flowered; spathes long-acuminate from an ovate base, red; pedicels slender, 12 mm. long; perianth red, the tube cylindric, slender, 2.8 cm. long, the segments linear, equaling the tube, 1—1.5 mm. broad, 1-nerved; stamens equaling the perianth-segments; ovary 3-lobed; ovules solitary.

Haemanthus cruentatus Schum. & Thonn., in Besch. Pl. Guin. 168. 1827.—Leaves oblong-lanceolate-linguiform, subundulate, obtuse with a broad mucro, concave, completely glabrous, erect; umbel many-flowered, hemispheric; pedicels not articulated, longer than the involucre. Bulb tunicated, of the size of that of *Allium cepa*, conic-subglobose, white, sitting upon the bulb of the preceding year, this being cylindric, fleshy, solid, marked with annulate scars, bearing here and there unbranched

rootlets, removed beneath; leaves subbifarious, lanceolate, acute, subundulate, obtusely keeled, completely glabrous, erect, recurved as long as the scape, ending in a sheath at the base or linguiform, minutely undulate; leaf-sheaths forming a short, spotted pseudo-stem; scape a foot tall, obsoletely trigonous, completely glabrous, nude, marked with scattered confluent dark-purple spots; umbel hemispheric, many-flowered, blooming before the leaves appear; involucre spathaceous, polyphyllous, shorter than the umbel, reflexed, withering; pedicels an inch long, not articulated, mixed with very slender pieces [bracteoles] almost as long as the pedicels. Corolla superior, its tube half an inch long, cylindric, obsoletely hexagonal, erect, its limb horizontal, 6-parted, the segments narrowly linear, slightly longer than the tube; filaments 6, inserted in the mouth of the tube, opposite the segments of the limb, subulate, spreading, somewhat longer than the limb, scarlet; anthers oblong, incumbent; ovary ovate, green; style somewhat longer than the stamens, erect, scarlet; stigma simple, subacute; berry of the size of a large pea, subglobose, completely glabrous, scarlet, umbilicate with the rudiment of the corolla, 3-celled, one or the other locule often aborted; seeds solitary, convex, callous. Tropical Africa.

Haemanthus bivalvis G. Beck, in Paulitschke. Harrar. 542, fig. 1. 1888.—Scape strict, articulated beneath, closely plicate in drying, red-spotted beneath, 24 cm. tall; leaves not known; bracts very broad, 2-valved from the shortly connate base, glabrous; one valve ovate, acute, 35 mm. broad, the other 2-toothed and 23 mm. broad, both bluish in drying, equaling the perianth (excluding the filaments) in length; bracteoles subfiliform, subequaling the peduncles in length; peduncles 1—1.5 cm. long; perianth (rose?), the tube cylindric, 1 cm. long, the segments very narrowly linear, on the inner side marked with papillose warts below the apex, slightly longer than the tube; filaments narrowly linear, twice as long as the perianth; style filiform, slightly surpassing the stamens; stigma capitate; immature fruit subglobose.

Found on Mount Haqim near the city of Harrar. Related to *H. tenuiflorus* Herb., Bot. Mag. pl. 3870, and its variety *coccineus* Hook., Bot. Mag., pl. 5881, but distinguished by the form of the involucre, the longer filaments, shorter style, and the segments of the perianth being barbate-verrucose below the apex.

Sect. BRISEIS (Salisb.) Stearn, (*Allium*) in *Herbertia* 11(1944): 20. 1946.—Petals coalesced into a disk at the base, recurved, oblong, the inner ones narrower, connivent and scarious after anthesis; filaments inserted in 2 series above the base of the petals, subulate; pericarp turbinate; style 3-fid; stigmas 3, hemispheric; seeds arillate. The name is poetic, alluding to the drooping fruits.

Sect. MICROSCORDUM Maxim., (*Allium*) in Bull. l'Acad. Imp. Sci. St. Petersburg 31: 107—108. 1887.—Perigonium shortly infundibular borne on a pedicel with dilated disciform apex, delicately membranous, 6-segmented, the segments erect, 1-nerved, the inner ones nar-

rower and slightly smaller; stamens 6, of which the 3 epipetalous ones are anantherous and often more or less deficient; filaments adnate at the base, narrowly subulate, somewhat shorter than or half as long as the perigonium; anthers dorsifixed, introrse, small, broadly oval; ovary lying on a broad base, indistinctly 3-celled, the cells opposite to the inner segments of the perigonium, 2-ovulate; style 3-sulcate, divided into 3 oblong stigmas which are arcuate-spreading and papillose all around; capsule fleshy-parenchymatous, the mature capsule and seeds not known. Herbs of the size of one's hand, with an alliaceous odor; bulb the size of a pea, solitary, the outer coat brown, parallel-fibrous, the transverse fibrils likewise parallel, loosely connected to each other, the inner coat hyaline; the underground portion of the stem enclosed in a hyaline tubular sheath; leaves 1 or 2, radical, appearing as though contracted into an elongated petiole lanceolate-linear, acuminate, greatly surpassing the umbel; bracts as many as the flowers, hyaline, acute, slightly shorter than the flowers; flowers 1 or rarely 2, one borne on a very short, thick, included pedicel, the other if produced at all is subsessile.

Sect. MOLY Moench, (*Allium*) in Endl., Gen. Pl. 147. 1836.—Stamens all equal, filiform or subulate; ovary 3-celled.

Sect. OPHIOSCORDON Wallr. (*Allium*), in Endl., Gen. Pl. 147. 1836.—Stamens equal, subulate; ovary 1-celled.

Sect. CODONOPRASUM Reichenb. (*Allium*), in Endl., Gen. Pl. 147. 1836.—Stamens all equal, connate at the base, connected in a ring to the segments of the perigonium; ovary 3-celled.

Sect. SCHOENOPRASUM Kunth, (*Allium*), in Endl., Gen. Pl. 147. 1836. The alternate stamens tricuspidate, the middle tooth anther bearing; ovary 3-celled.

Hymenocallis Niederleinii Pax, Bot. Jahrb. 11: 326. 1890.—In the affinity of *H. pedalis* (Lodd.) Herb. Leaves narrowly oblong, acute, narrowed toward the base into a short winged petiole; flowers white; tube of the perigonium very long, narrowly cylindrical, the segments very narrowly linear, much shorter than the tube, obtuse; paracorolla funnel-form; filaments arising from the margin of the paracorolla, filiform, *half as long as the perigonium*; anthers versatile, elongate; style filiform, greatly surpassing the stamens, almost equaling the perigonium; stigma capitate; ovary ovoid, beaked; ovules about 6 per locule.

Bulb unknown; leaves 28 cm. long, 5 cm. wide at the middle, narrowed to 1.5 cm. at the base; scape unknown; tube of the perigonium 15 cm. long, almost 3 mm. in diameter; the segments 9–10 cm. long, 2 mm. wide; paracorolla 2.5 cm. long; filaments 5 cm. long; anthers 2 cm. long or longer; style to 25 cm. long; ovary to 2 cm. long. Argentina.

Zephyranthes jujuyensis Holmb., Anal. Mus. Buenos Aires, ser. 3, 4: 523. 1905.—Bulb ovate-pyriform, tunics dark brown to black, 1.5–1.75 cm. in diameter, the neck 1 to 2 or 3 cm. long; leaves erect, rather

rigid, growing up after anthesis, often 3, rarely 2 or 5, opaque, green, becoming darkish-purplish at the base, the color disappearing toward the very bottom, slightly glaucescent, linear, curved-canaliculate, the upper fourth or fifth partly flattened, rather obtuse on the back, aristate in the middle, sometimes more or less falcate, rather narrowed toward the extremity, elliptic and rounded or rarely acutish at the apex, successively gradated in size, sometimes reaching 30 cm. in length, 6.5—7 mm. wide, the extreme half gradually narrowed to the base; scape green-glaucous, gradually rufescent from the middle upwards, transversely elliptic, 5—11.5 cm. long, 2.5 x 3.5 or 3.5 x 4.5 mm. in diameter, scarcely attenuate toward the apex; spathe dark brown or brown-violet or brown-purple, 3.5 cm. long, the basal half tubular, with the segments split to the middle, paler in drying; pedicel 1—2 cm. long, slightly narrower than the scape, greenish, lined with dark-brown, slightly declinate at the apex; perianth 6 cm. long and in full sunlight 7 cm. in diameter, the segments curvate-spreading extrorsely, the tube 5 mm. long, naked within, the segments coalesced at the base, lanceolate, slightly shell-shaped; sepals 6 cm. long, the uppermost 14 mm. wide at the middle, the 2 others 13 mm. wide; petals 5.5 cm. long, 11 mm. wide; the perianth finally white, the lobes greenish at the base within, marked with pale-gray narrow lines, outside the basal half or third more intensely green, fading out toward the margins and toward the apex, the sepals marked with narrow dark-brown, pale-brown, or brownish-violet lines (absent at the margins)—in one specimen the uppermost sepal is rather sordidly lilac-netted on the outside, in the 2 others more deeply so—green and mucronate at the apex, sometimes fuscous-violet at the very base; petals marked on the outside with narrow gray or somewhat darker lines and rose-netted at the apex; ovary greenish-brown, 7 mm. long, slightly thickened toward the apex, obpyramidal; stamens unequal, often tri-dynamous; filaments pale-green, paler toward the apex, free and arcuately geniculate in the throat, the longer ones 2.75 cm. long; immature anthers slender, 1 mm. in diameter, 12—13 mm. long, paler yellow; style 3—3.25 cm. long, very slightly declinate, whitish toward the apex, pale-green toward the base; stigma trifid, the segments arcuately spreading and 3.5 mm. long, the style with a linear sulcation [channel] leading to each sinus between the stigma-branches; capsule unknown.

Var. *volcanica*, with the perianth white, the basal third greenish, with the narrow lines obsolete or almost so, 5 cm. long, the scape 11.5 cm. long. Jujuy, Argentina.

Zephyranthes [*Euzephyranthes*] *lactea* S. Moore, Trans. Linn. Soc. Lond., ser. 2, 4: 495. 1895.—Bulb ovoid, densely covered with dark-brown tunics which are prolonged into a neck to 2 cm. beyond the bulb; leaves radical, elongate, narrowly linear, obtuse, produced at the time of anthesis; scape slender, rarely ampliate upwards; spathe oblong, 2—2.5 cm. long, bifid at the apex in the fashion of this genus; peduncle sometimes equaling the spathe, sometimes longer or shorter than it, slender; flowers medium-sized; tube of the perianth very short, the lobes

ovate-lanceolate, shortly acuminate, closely connate to each other and thus producing a false tube which is slightly and gradually ampliate at its apex to 0.5 cm.; stamens inserted very close to the base of the tube; three filaments flattened, borne opposite the interior segments of the perianth, equally long but longer than the other 3, the 3 shorter ones also equally long; stigma unequally trifid. It grows in open places at Jangada, Brazil, blooming in September (no. 283).

Bulb 1.5 cm. in diameter, 1 cm. long, the neck plainly 1—2 cm. long and 0.7—0.9 cm. in diameter; leaves radical, 8—14 cm. long, sometimes attenuate to the base, 0.2—0.3 cm. wide; spathe 6—16 cm. long to the spathe, very slightly ampliate beneath the spathe and thickened there after the flowers have fallen; spathe to 3 cm. long, rather lax, bifid to about 0.5 cm.; peduncle 2—5 cm. long, slender or thickened; flowers white; the flower in all 4.5 cm. long, scarcely 3 cm. in diameter; tube of the perianth 0.4 cm. long, with a small ring of small fringed scales; anthers narrowly linear, 1.2 cm. long; the shorter filaments 0.5 cm. long, the longer ones 2 cm. long; style 1.8—2.1 cm. long, its branches 0.15 cm. long.

It differs from *Z. cearensis* Baker in its larger white flowers, the scaly tube of the perianth, the unequal much larger stamens, etc. From Goyaz, in eastern Brazil.

Zephyranthes chrysantha Greenm. & Thompson, Ann. Missouri Bot. Gard. 1: 406. 1914.—Bulb subglobose, 2—2.5 cm. in diameter, clothed with brownish-nigrescent tunics, the neck 3—5 cm. long, 6—8 mm. in diameter; leaves 2—4, produced during anthesis, linear, 2.5—4.5 dm. long, 2—3 mm. wide, glabrous; scape 2—3 dm. tall, glabrous; spathe membranous, 2.5—3.5 cm. long, tubular below, the tube 1—1.5 cm. long, the lobe unilateral, lanceolate, 1.5—2 cm. long; pedicels 2.5—3.5 cm. long, slender; perianth infundibular, 3—3.5 cm. long, yellow, 6-lobed, its tube cylindric, about 5 mm. long, the lobes oblanceolate, 3—3.2 cm. long, 5—12 mm. wide, acute; stamens inserted at the apex of the perianth-tube, half as long as its segments; style shortly 3-lobed, subequaling the stamens; capsule depressed-globose, 10—12 mm. long and wide; seeds numerous, irregularly compressed, 5—6 mm. long, 2—5 mm. wide, blackened and often shiny. Texas.

Zephyranthes (Pyrolirion) pseudocolchicum Kraenzl. in Fedde, Repert. 13: 118. 1914.—Bulbs 4—5 cm. long 3—4 cm. thick narrowed into a neck which is to 3 cm. long; cataphylls hyaline, very thin, dry; permanent leaves absent during anthesis, one finds only rudimentary linear primordia of young ones among the cataphylls; flowers always single, borne directly upon the bulb, the ovary very shortly pedunculate or sessile; perigonium-tube slenderly cylindric, 8—9 cm. long, above that divided into 6 oblong-lanceolate, acute, slightly spreading segments, all 6 brick-red, quite intensely punctulate, 3 cm. long, 8—10 mm. wide; stamens equally long, the filaments narrowed from the broader base, about

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[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 176.]

1 cm. long, the anthers large; style very long, about equaling the perigonium, slightly surpassing the anthers; stigma capitate, manifestly trilobed, coarsely papillose. Flowers in November, Bolivia.

Zephyranthes stenopetala Baker, Kew Bull. 226. 1899; differs from the remaining species of the section *Euzephyranthes* in having linear perianth-segments.

Bulb globose, 1 inch in diameter, the exterior tunics membranaceous, brown; leaves erect, narrowly linear, glabrous; peduncle slender, fragile, 1-flowered, 8—9 inches long; spathe membranaceous, 30 mm. long, cylindrical, bifid at the apex, the valves small, subulate; pedicel erect, 30—36 mm. long; perianth pale-red, 42 mm. long, the tube short, the segments of the limb linear; stamens one-third as long as the perianth; anthers small, linear-oblong; style 3-cuspidate; capsule oblong, 4 mm. long. Uruguay.

Zephyranthes longistyla Pax, Bot. Jahrb. 11: 323. 1889.—In the affinity of *Z. minima* Herb. Dwarf; leaves synanthous, filiform, equaling or surpassing the scape; spathe bifid almost to the middle; pedicel half as long as the spathe; flower erect, sulphur-yellow; perigonium medium-sized, the tube short, the segments elliptic or obovate, acute or mucronulate; [3] shorter filaments alternating with [3] longer filaments; style elongate, greatly surpassing the stamens, trifid; capsule small.

Bulb brown, ovate-oblong, 1.5—2 cm. in diameter; leaves slender, green, often irregularly spirally contracted when dry, 8—15 cm. long; scape slender, 5—8 cm. tall; spathe almost 2 cm. long, bifid to the middle, the segments very acuminate, hyaline, pale or almost rosy; flower shortly pedicellate, pedicel almost 1 cm. long, slender; segments of the perigonium 2—3 cm. long, almost 1 cm. wide; style 2 cm. long; capsule scarcely 5 mm. in diameter. Argentina.

Zephranthes (Euzephyranthes) viridilutea Kraenzl. in Fedde, Repert. 13: 118. 1914.—Bulbs globose, 4 cm. in diameter, attenuate into a neck 3 cm. long; leaves absent at time of anthesis; scape without the flower to 35 cm. tall, 1-flowered; spathe short, 2 cm. long, shiny, white; ovary sessile, the apex thicker than the base, 2 cm. long; the tube of the perigonium very short, scarcely 4 mm. long, the segments lanceolate, acuminate, 4.5 cm. long, 6 or 7 mm. wide, the sepals yellow-green (except for the margin) outside, yellow inside; petals yellow, marked with a green median line, slightly broader [than the sepals]; perigonial scales absent; stamens inserted slightly above the base of the perigonium; filaments about 1.3—1.5 cm. long; anthers contorted; style with the stigma 4 cm. long in all, the stigma itself about 1 cm. long, spatulate, greatly

[Moldenke—AMARYLLID GENERA AND SPECIES, continued on page 35.]

[Moldenke—AMARYLLID GENERA AND SPECIES, continued from page 98.]

capitate stigma included. Argentina.

Hippeastrum organense var. *compressum* Herb., Bot. Reg. Lond. 28: misc. p. 39. 1842.—Differing from *H. organense* in its larger bulb; leaves glaucous, scarcely an inch wide, subobtuse, erect; scape glaucous, more often 2-flowered; perianth laterally compressed (the vertical expansion $6\frac{1}{2}$ inches, the lateral 4 inches), brick-red, with the veins more deeply colored, the star and rays between the veins green, the tube short, the calyptra almost obsolete, and the segments of the limb flat beneath, the upper sepal 2 inches wide. Observation: *H. aulicum* var. *glaucophyllum* of the Bot. Mag. has very little relation to *H. aulicum* and is perhaps better regarded as a variety of *H. organense*.

Zephyranthes lilacina Speg., Physis 3: 40. 1917.—*Zephyrites*, proterantherous, with the scape elevated, green; spathe narrow, deeply bifid, pink; flowers rather large, often solitary and more or less declinate, supported on a pedicel which is slightly longer than the spathe; tepals free almost to the base, the upper third beautifully and intensely lilac, the median third rose-colored and longitudinally white-striate, the lower third greenish, bearing at the very base obovate conspicuously fimbriate little scales; outer stamens $\frac{2}{3}$ as long as the tepals, the inner ones $\frac{1}{3}$ as long; filaments greenish-white; anthers yellow, horseshoe-shaped; ovary ovate; style whitish, slightly surpassing the larger stamens, trifid at the apex; stigmas revolute. Leaves and capsules unknown to me. Argentina. Found after rains in the meadows in the neighborhood of Posadas, Misiones, Argentina. January 1907.

Cooperia miradorensis Kraenzl. in Fedde, Repert. 121: 75. 1925.—Bulbs and leaves are lacking; scape with a single flower to 30 cm. tall, slender, smooth, completely naked; sheath 2-valved, hyaline, shiny pellucid, to 2.5 cm. long, the valves equally long, acuminate, indistinctly equaling the pedicels of the flowers; ovary globose or short-obovoid; tube of the perigonium very narrowly cylindrical for 1.5 cm. of its length, later rather widened, toward the apex narrowly funnel-form, the free part of the segments oblong-lanceolate, acute, the entire perigonium (excepting the ovary) 4.5—5 cm. long, 1 cm. in diameter at its orifice. In fields at Mirador, Mexico (Liebmann 7925).